
Erste Partielle Differentiale thermodynamischer Zustandsgrößen

— Vollständige Liste —

- v: spezifisches Volumen
T: Temperatur
p: Druck
u: spezifische innere Energie
s: spezifische Entropie
h: spezifische Enthalpie
f: spezifische freie Energie
g: spezifische freie Enthalpie

s	h	p
u		g
v	f	T

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Jegliche Verfielfältigung bedarf der Genehmigung durch die IgH.

Für die Richtigkeit wird trotz sorgfältiger Erstellung keine Gewähr übernommen.

¹maxwell, Stand 24. Mai 2000

1 Differentiale des spezifischen Volumens v

1. $\left(\frac{\partial v}{\partial T}\right)_p = -\left(\frac{\partial p}{\partial T}\right)_v / \left(\frac{\partial p}{\partial v}\right)_T$
2. $\left(\frac{\partial v}{\partial T}\right)_u = -c_v / \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)$
3. $\left(\frac{\partial v}{\partial T}\right)_s = -c_v / \left(T \left(\frac{\partial p}{\partial T}\right)_v\right)$
4. $\left(\frac{\partial v}{\partial T}\right)_h = -\frac{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}$
5. $\left(\frac{\partial v}{\partial T}\right)_f = -s / p$
6. $\left(\frac{\partial v}{\partial T}\right)_g = \frac{s - v \left(\frac{\partial p}{\partial T}\right)_v}{v \left(\frac{\partial p}{\partial v}\right)_T}$
7. $\left(\frac{\partial v}{\partial p}\right)_T = 1 / \left(\frac{\partial p}{\partial v}\right)_T$
8. $\left(\frac{\partial v}{\partial p}\right)_u = c_v / \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
9. $\left(\frac{\partial v}{\partial p}\right)_s = c_v / \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
10. $\left(\frac{\partial v}{\partial p}\right)_h = \frac{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}{-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
11. $\left(\frac{\partial v}{\partial p}\right)_f = s / \left(-p \left(\frac{\partial p}{\partial T}\right)_v + s \left(\frac{\partial p}{\partial v}\right)_T\right)$
12. $\left(\frac{\partial v}{\partial p}\right)_g = \frac{s - v \left(\frac{\partial p}{\partial T}\right)_v}{s \left(\frac{\partial p}{\partial v}\right)_T}$
13. $\left(\frac{\partial v}{\partial u}\right)_T = 1 / \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)$
14. $\left(\frac{\partial v}{\partial u}\right)_p = \left(\frac{\partial p}{\partial T}\right)_v / \left(-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
15. $\left(\frac{\partial v}{\partial u}\right)_s = -1 / p$
16. $\left(\frac{\partial v}{\partial u}\right)_h = \frac{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}{-p(c_v + v \left(\frac{\partial p}{\partial T}\right)_v) + v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
17. $\left(\frac{\partial v}{\partial u}\right)_f = s / \left(-p(s + c_v) + T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
18. $\left(\frac{\partial v}{\partial u}\right)_g = \frac{-s + v \left(\frac{\partial p}{\partial T}\right)_v}{p(s - v \left(\frac{\partial p}{\partial T}\right)_v) + v T \left(\frac{\partial p}{\partial T}\right)_v^2 - (v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v)}$
19. $\left(\frac{\partial v}{\partial s}\right)_T = 1 / \left(\frac{\partial p}{\partial T}\right)_v$
20. $\left(\frac{\partial v}{\partial s}\right)_p = T \left(\frac{\partial p}{\partial T}\right)_v / \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
21. $\left(\frac{\partial v}{\partial s}\right)_u = T / p$
22. $\left(\frac{\partial v}{\partial s}\right)_h = T \frac{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}{v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$

23. $\left(\frac{\partial v}{\partial s}\right)_f = Ts / \left(-pc_v + Ts \left(\frac{\partial p}{\partial T}\right)_v\right)$
24. $\left(\frac{\partial v}{\partial s}\right)_g = T \frac{-s+v\left(\frac{\partial p}{\partial T}\right)_v}{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
25. $\left(\frac{\partial v}{\partial h}\right)_T = 1 / \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)$
26. $\left(\frac{\partial v}{\partial h}\right)_p = \left(\frac{\partial p}{\partial T}\right)_v / \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
27. $\left(\frac{\partial v}{\partial h}\right)_u = c_v / \left(p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)$
28. $\left(\frac{\partial v}{\partial h}\right)_s = c_v / \left(v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)$
29. $\left(\frac{\partial v}{\partial h}\right)_f = s / \left(-p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
30. $\left(\frac{\partial v}{\partial h}\right)_g = \frac{-s+v\left(\frac{\partial p}{\partial T}\right)_v}{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T (s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
31. $\left(\frac{\partial v}{\partial f}\right)_T = -1/p$
32. $\left(\frac{\partial v}{\partial f}\right)_p = \left(\frac{\partial p}{\partial T}\right)_v / \left(-p \left(\frac{\partial p}{\partial T}\right)_v + s \left(\frac{\partial p}{\partial v}\right)_T\right)$
33. $\left(\frac{\partial v}{\partial f}\right)_u = c_v / \left(-p (s + c_v) + Ts \left(\frac{\partial p}{\partial T}\right)_v\right)$
34. $\left(\frac{\partial v}{\partial f}\right)_s = c_v / \left(-pc_v + Ts \left(\frac{\partial p}{\partial T}\right)_v\right)$
35. $\left(\frac{\partial v}{\partial f}\right)_h = \frac{c_v+v\left(\frac{\partial p}{\partial T}\right)_v}{-p(c_v+v\left(\frac{\partial p}{\partial T}\right)_v) + s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}$
36. $\left(\frac{\partial v}{\partial f}\right)_g = \frac{-s+v\left(\frac{\partial p}{\partial T}\right)_v}{-pv\left(\frac{\partial p}{\partial T}\right)_v + s(p+v\left(\frac{\partial p}{\partial v}\right)_T)}$
37. $\left(\frac{\partial v}{\partial g}\right)_T = 1 / \left(v \left(\frac{\partial p}{\partial v}\right)_T\right)$
38. $\left(\frac{\partial v}{\partial g}\right)_p = \left(\frac{\partial p}{\partial T}\right)_v / \left(s \left(\frac{\partial p}{\partial v}\right)_T\right)$
39. $\left(\frac{\partial v}{\partial g}\right)_u = c_v / \left(v \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
40. $\left(\frac{\partial v}{\partial g}\right)_s = c_v / \left(v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts \left(\frac{\partial p}{\partial T}\right)_v\right)$
41. $\left(\frac{\partial v}{\partial g}\right)_h = \frac{c_v+v\left(\frac{\partial p}{\partial T}\right)_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
42. $\left(\frac{\partial v}{\partial g}\right)_f = s / \left(-pv \left(\frac{\partial p}{\partial T}\right)_v + s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)\right)$

2 Differentiale der Temperatur T

1. $\left(\frac{\partial T}{\partial v}\right)_p = -\left(\frac{\partial p}{\partial v}\right)_T / \left(\frac{\partial p}{\partial T}\right)_v$
2. $\left(\frac{\partial T}{\partial v}\right)_u = \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
3. $\left(\frac{\partial T}{\partial v}\right)_s = -T \left(\frac{\partial p}{\partial T}\right)_v / c_v$
4. $\left(\frac{\partial T}{\partial v}\right)_h = -\frac{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}{c_v + v\left(\frac{\partial p}{\partial T}\right)_v}$
5. $\left(\frac{\partial T}{\partial v}\right)_f = -p / s$
6. $\left(\frac{\partial T}{\partial v}\right)_g = -v \left(\frac{\partial p}{\partial v}\right)_T / \left(-s + v \left(\frac{\partial p}{\partial T}\right)_v\right)$
7. $\left(\frac{\partial T}{\partial p}\right)_v = 1 / \left(\frac{\partial p}{\partial T}\right)_v$
8. $\left(\frac{\partial T}{\partial p}\right)_u = \frac{-p + T\left(\frac{\partial p}{\partial T}\right)_v}{-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
9. $\left(\frac{\partial T}{\partial p}\right)_s = T \left(\frac{\partial p}{\partial T}\right)_v / \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
10. $\left(\frac{\partial T}{\partial p}\right)_h = \frac{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}$
11. $\left(\frac{\partial T}{\partial p}\right)_f = p / \left(p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T\right)$
12. $\left(\frac{\partial T}{\partial p}\right)_g = v / s$
13. $\left(\frac{\partial T}{\partial u}\right)_v = 1 / c_v$
14. $\left(\frac{\partial T}{\partial u}\right)_p = \left(\frac{\partial p}{\partial v}\right)_T / \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
15. $\left(\frac{\partial T}{\partial u}\right)_s = T \left(\frac{\partial p}{\partial T}\right)_v / (p c_v)$
16. $\left(\frac{\partial T}{\partial u}\right)_h = \frac{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
17. $\left(\frac{\partial T}{\partial u}\right)_f = p / \left(p(s + c_v) - T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
18. $\left(\frac{\partial T}{\partial u}\right)_g = v \left(\frac{\partial p}{\partial v}\right)_T / \left(v \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
19. $\left(\frac{\partial T}{\partial s}\right)_v = T / c_v$
20. $\left(\frac{\partial T}{\partial s}\right)_p = T \left(\frac{\partial p}{\partial v}\right)_T / \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
21. $\left(\frac{\partial T}{\partial s}\right)_u = T \frac{p - T \left(\frac{\partial p}{\partial T}\right)_v}{p c_v}$
22. $\left(\frac{\partial T}{\partial s}\right)_h = T \frac{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$

23. $\left(\frac{\partial T}{\partial s}\right)_f = pT / \left(p c_v - T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
24. $\left(\frac{\partial T}{\partial s}\right)_g = vT \left(\frac{\partial p}{\partial v}\right)_T / \left(v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
25. $\left(\frac{\partial T}{\partial h}\right)_v = 1 / \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right)$
26. $\left(\frac{\partial T}{\partial h}\right)_p = \left(\frac{\partial p}{\partial v}\right)_T / \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
27. $\left(\frac{\partial T}{\partial h}\right)_u = \frac{-p + T \left(\frac{\partial p}{\partial T}\right)_v}{-p(c_v + v \left(\frac{\partial p}{\partial T}\right)_v) + v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
28. $\left(\frac{\partial T}{\partial h}\right)_s = T \left(\frac{\partial p}{\partial T}\right)_v / \left(v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)$
29. $\left(\frac{\partial T}{\partial h}\right)_f = p / \left(p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) - s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
30. $\left(\frac{\partial T}{\partial h}\right)_g = v \left(\frac{\partial p}{\partial v}\right)_T / \left(v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
31. $\left(\frac{\partial T}{\partial f}\right)_v = -1 / s$
32. $\left(\frac{\partial T}{\partial f}\right)_p = \left(\frac{\partial p}{\partial v}\right)_T / \left(p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T\right)$
33. $\left(\frac{\partial T}{\partial f}\right)_u = \frac{-p + T \left(\frac{\partial p}{\partial T}\right)_v}{p(s + c_v) - T s \left(\frac{\partial p}{\partial T}\right)_v}$
34. $\left(\frac{\partial T}{\partial f}\right)_s = T \left(\frac{\partial p}{\partial T}\right)_v / \left(p c_v - T s \left(\frac{\partial p}{\partial T}\right)_v\right)$
35. $\left(\frac{\partial T}{\partial f}\right)_h = \frac{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}{p(c_v + v \left(\frac{\partial p}{\partial T}\right)_v) - s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)}$
36. $\left(\frac{\partial T}{\partial f}\right)_g = v \left(\frac{\partial p}{\partial v}\right)_T / \left(pv \left(\frac{\partial p}{\partial T}\right)_v - s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)\right)$
37. $\left(\frac{\partial T}{\partial g}\right)_v = 1 / \left(-s + v \left(\frac{\partial p}{\partial T}\right)_v\right)$
38. $\left(\frac{\partial T}{\partial g}\right)_p = -1 / s$
39. $\left(\frac{\partial T}{\partial g}\right)_u = \frac{-p + T \left(\frac{\partial p}{\partial T}\right)_v}{p(s - v \left(\frac{\partial p}{\partial T}\right)_v) + vT \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v\right)}$
40. $\left(\frac{\partial T}{\partial g}\right)_s = T \left(\frac{\partial p}{\partial T}\right)_v / \left(vT \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
41. $\left(\frac{\partial T}{\partial g}\right)_h = \frac{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}{vT \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T (s + c_v) + T s \left(\frac{\partial p}{\partial T}\right)_v\right)}$
42. $\left(\frac{\partial T}{\partial g}\right)_f = p / \left(pv \left(\frac{\partial p}{\partial T}\right)_v - s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)\right)$

3 Differentiale des Drucks p

1. $\left(\frac{\partial p}{\partial v}\right)_T = \left(\frac{\partial p}{\partial v}\right)_T$
2. $\left(\frac{\partial p}{\partial v}\right)_u = \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / c_v$
3. $\left(\frac{\partial p}{\partial v}\right)_s = \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) / c_v$
4. $\left(\frac{\partial p}{\partial v}\right)_h = \frac{-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}$
5. $\left(\frac{\partial p}{\partial v}\right)_f = \left(-p \left(\frac{\partial p}{\partial T}\right)_v + s \left(\frac{\partial p}{\partial v}\right)_T\right) / s$
6. $\left(\frac{\partial p}{\partial v}\right)_g = -s \left(\frac{\partial p}{\partial v}\right)_T / \left(-s + v \left(\frac{\partial p}{\partial T}\right)_v\right)$
7. $\left(\frac{\partial p}{\partial T}\right)_v = \left(\frac{\partial p}{\partial T}\right)_v$
8. $\left(\frac{\partial p}{\partial T}\right)_u = \frac{-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{-p + T \left(\frac{\partial p}{\partial T}\right)_v}$
9. $\left(\frac{\partial p}{\partial T}\right)_s = \frac{T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T \left(\frac{\partial p}{\partial T}\right)_v}$
10. $\left(\frac{\partial p}{\partial T}\right)_h = \frac{T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}$
11. $\left(\frac{\partial p}{\partial T}\right)_f = \left(p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T\right) / p$
12. $\left(\frac{\partial p}{\partial T}\right)_g = s / v$
13. $\left(\frac{\partial p}{\partial u}\right)_v = \left(\frac{\partial p}{\partial T}\right)_v / c_v$
14. $\left(\frac{\partial p}{\partial u}\right)_T = \left(\frac{\partial p}{\partial v}\right)_T / \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)$
15. $\left(\frac{\partial p}{\partial u}\right)_s = \frac{T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{p c_v}$
16. $\left(\frac{\partial p}{\partial u}\right)_h = \frac{-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{-p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
17. $\left(\frac{\partial p}{\partial u}\right)_f = \frac{p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T}{p \left(s + c_v\right) - T s \left(\frac{\partial p}{\partial T}\right)_v}$
18. $\left(\frac{\partial p}{\partial u}\right)_g = -s \left(\frac{\partial p}{\partial v}\right)_T / \left(p \left(s - v \left(\frac{\partial p}{\partial T}\right)_v\right) + v T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
19. $\left(\frac{\partial p}{\partial s}\right)_v = T \left(\frac{\partial p}{\partial T}\right)_v / c_v$
20. $\left(\frac{\partial p}{\partial s}\right)_T = \left(\frac{\partial p}{\partial v}\right)_T / \left(\frac{\partial p}{\partial T}\right)_v$
21. $\left(\frac{\partial p}{\partial s}\right)_u = T \frac{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)}{p c_v}$

22. $\left(\frac{\partial p}{\partial s}\right)_h = T \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
23. $\left(\frac{\partial p}{\partial s}\right)_f = T \frac{p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T}{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}$
24. $\left(\frac{\partial p}{\partial s}\right)_g = -Ts\left(\frac{\partial p}{\partial v}\right)_T / \left(vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
25. $\left(\frac{\partial p}{\partial h}\right)_v = \left(\frac{\partial p}{\partial T}\right)_v / \left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right)$
26. $\left(\frac{\partial p}{\partial h}\right)_T = \left(\frac{\partial p}{\partial v}\right)_T / \left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
27. $\left(\frac{\partial p}{\partial h}\right)_u = \frac{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)}{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
28. $\left(\frac{\partial p}{\partial h}\right)_s = 1/v$
29. $\left(\frac{\partial p}{\partial h}\right)_f = \frac{p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T}{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
30. $\left(\frac{\partial p}{\partial h}\right)_g = -s\left(\frac{\partial p}{\partial v}\right)_T / \left(vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T (s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
31. $\left(\frac{\partial p}{\partial f}\right)_v = -\left(\frac{\partial p}{\partial T}\right)_v / s$
32. $\left(\frac{\partial p}{\partial f}\right)_T = -\left(\frac{\partial p}{\partial v}\right)_T / p$
33. $\left(\frac{\partial p}{\partial f}\right)_u = \frac{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)}{-p(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
34. $\left(\frac{\partial p}{\partial f}\right)_s = \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
35. $\left(\frac{\partial p}{\partial f}\right)_h = \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
36. $\left(\frac{\partial p}{\partial f}\right)_g = -s\left(\frac{\partial p}{\partial v}\right)_T / \left(-pv\left(\frac{\partial p}{\partial T}\right)_v + s\left(p + v\left(\frac{\partial p}{\partial v}\right)_T\right)\right)$
37. $\left(\frac{\partial p}{\partial g}\right)_v = \left(\frac{\partial p}{\partial T}\right)_v / \left(-s + v\left(\frac{\partial p}{\partial T}\right)_v\right)$
38. $\left(\frac{\partial p}{\partial g}\right)_T = 1/v$
39. $\left(\frac{\partial p}{\partial g}\right)_u = \frac{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)}{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)\right) + s\left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
40. $\left(\frac{\partial p}{\partial g}\right)_s = \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
41. $\left(\frac{\partial p}{\partial g}\right)_h = \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
42. $\left(\frac{\partial p}{\partial g}\right)_f = \frac{p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T}{pv\left(\frac{\partial p}{\partial T}\right)_v - s\left(p + v\left(\frac{\partial p}{\partial v}\right)_T\right)}$

4 Differentiale der spezifischen inneren Energie u

1. $\left(\frac{\partial u}{\partial v}\right)_T = -p + T \left(\frac{\partial p}{\partial T}\right)_v$
2. $\left(\frac{\partial u}{\partial v}\right)_p = \left(-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / \left(\frac{\partial p}{\partial T}\right)_v$
3. $\left(\frac{\partial u}{\partial v}\right)_s = -p$
4. $\left(\frac{\partial u}{\partial v}\right)_h = \frac{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{c_v + v\left(\frac{\partial p}{\partial T}\right)_v}$
5. $\left(\frac{\partial u}{\partial v}\right)_f = \left(-p(s + c_v) + T s \left(\frac{\partial p}{\partial T}\right)_v\right) / s$
6. $\left(\frac{\partial u}{\partial v}\right)_g = \frac{p(s - v\left(\frac{\partial p}{\partial T}\right)_v) + vT\left(\frac{\partial p}{\partial T}\right)_v^2 - (v\left(\frac{\partial p}{\partial v}\right)_T c_v + T s\left(\frac{\partial p}{\partial T}\right)_v)}{-s + v\left(\frac{\partial p}{\partial T}\right)_v}$
7. $\left(\frac{\partial u}{\partial T}\right)_v = c_v$
8. $\left(\frac{\partial u}{\partial T}\right)_p = \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / \left(\frac{\partial p}{\partial v}\right)_T$
9. $\left(\frac{\partial u}{\partial T}\right)_s = p c_v / \left(T \left(\frac{\partial p}{\partial T}\right)_v\right)$
10. $\left(\frac{\partial u}{\partial T}\right)_h = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}$
11. $\left(\frac{\partial u}{\partial T}\right)_f = \left(p(s + c_v) - T s \left(\frac{\partial p}{\partial T}\right)_v\right) / p$
12. $\left(\frac{\partial u}{\partial T}\right)_g = \frac{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s\left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{v\left(\frac{\partial p}{\partial v}\right)_T}$
13. $\left(\frac{\partial u}{\partial p}\right)_v = c_v / \left(\frac{\partial p}{\partial T}\right)_v$
14. $\left(\frac{\partial u}{\partial p}\right)_T = \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial v}\right)_T$
15. $\left(\frac{\partial u}{\partial p}\right)_s = -p c_v / \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
16. $\left(\frac{\partial u}{\partial p}\right)_h = \frac{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
17. $\left(\frac{\partial u}{\partial p}\right)_f = \frac{p(s + c_v) - T s \left(\frac{\partial p}{\partial T}\right)_v}{p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T}$
18. $\left(\frac{\partial u}{\partial p}\right)_g = \frac{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s\left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{s\left(\frac{\partial p}{\partial v}\right)_T}$
19. $\left(\frac{\partial u}{\partial s}\right)_v = T$
20. $\left(\frac{\partial u}{\partial s}\right)_T = \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial T}\right)_v$
21. $\left(\frac{\partial u}{\partial s}\right)_p = T \frac{-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}$

22.
$$\left(\frac{\partial u}{\partial s}\right)_h = T \frac{-p(c_v + v(\frac{\partial p}{\partial T})_v) + v(T(\frac{\partial p}{\partial T})_v^2 - (\frac{\partial p}{\partial v})_T c_v)}{v(T(\frac{\partial p}{\partial T})_v^2 - (\frac{\partial p}{\partial v})_T c_v)}$$
23.
$$\left(\frac{\partial u}{\partial s}\right)_f = T \frac{p(s + c_v) - Ts(\frac{\partial p}{\partial T})_v}{pc_v - Ts(\frac{\partial p}{\partial T})_v}$$
24.
$$\left(\frac{\partial u}{\partial s}\right)_g = T \frac{p(s - v(\frac{\partial p}{\partial T})_v) - v(\frac{\partial p}{\partial v})_T c_v + T(\frac{\partial p}{\partial T})_v(-s + v(\frac{\partial p}{\partial T})_v)}{vT(\frac{\partial p}{\partial T})_v^2 - (v(\frac{\partial p}{\partial v})_T c_v + Ts(\frac{\partial p}{\partial T})_v)}$$
25.
$$\left(\frac{\partial u}{\partial h}\right)_v = c_v / \left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right)$$
26.
$$\left(\frac{\partial u}{\partial h}\right)_T = \frac{-p + T(\frac{\partial p}{\partial T})_v}{v(\frac{\partial p}{\partial v})_T + T(\frac{\partial p}{\partial T})_v}$$
27.
$$\left(\frac{\partial u}{\partial h}\right)_p = \frac{-(\frac{\partial p}{\partial v})_T c_v + (\frac{\partial p}{\partial T})_v(-p + T(\frac{\partial p}{\partial T})_v)}{T(\frac{\partial p}{\partial T})_v^2 - (\frac{\partial p}{\partial v})_T c_v}$$
28.
$$\left(\frac{\partial u}{\partial h}\right)_s = -pc_v / \left(v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)$$
29.
$$\left(\frac{\partial u}{\partial h}\right)_f = \frac{p(s + c_v) - Ts(\frac{\partial p}{\partial T})_v}{p(c_v + v(\frac{\partial p}{\partial T})_v) - s(v(\frac{\partial p}{\partial v})_T + T(\frac{\partial p}{\partial T})_v)}$$
30.
$$\left(\frac{\partial u}{\partial h}\right)_g = \frac{p(s - v(\frac{\partial p}{\partial T})_v) + vT(\frac{\partial p}{\partial T})_v^2 - (v(\frac{\partial p}{\partial v})_T c_v + Ts(\frac{\partial p}{\partial T})_v)}{vT(\frac{\partial p}{\partial T})_v^2 - (v(\frac{\partial p}{\partial v})_T (s + c_v) + Ts(\frac{\partial p}{\partial T})_v)}$$
31.
$$\left(\frac{\partial u}{\partial f}\right)_v = -c_v / s$$
32.
$$\left(\frac{\partial u}{\partial f}\right)_T = \left(p - T\left(\frac{\partial p}{\partial T}\right)_v\right) / p$$
33.
$$\left(\frac{\partial u}{\partial f}\right)_p = \frac{-(\frac{\partial p}{\partial v})_T c_v + (\frac{\partial p}{\partial T})_v(-p + T(\frac{\partial p}{\partial T})_v)}{-p(\frac{\partial p}{\partial T})_v + s(\frac{\partial p}{\partial v})_T}$$
34.
$$\left(\frac{\partial u}{\partial f}\right)_s = -pc_v / \left(-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)$$
35.
$$\left(\frac{\partial u}{\partial f}\right)_h = \frac{-p(c_v + v(\frac{\partial p}{\partial T})_v) + v(T(\frac{\partial p}{\partial T})_v^2 - (\frac{\partial p}{\partial v})_T c_v)}{-p(c_v + v(\frac{\partial p}{\partial T})_v) + s(v(\frac{\partial p}{\partial v})_T + T(\frac{\partial p}{\partial T})_v)}$$
36.
$$\left(\frac{\partial u}{\partial f}\right)_g = \frac{p(s - v(\frac{\partial p}{\partial T})_v) + vT(\frac{\partial p}{\partial T})_v^2 - (v(\frac{\partial p}{\partial v})_T c_v + Ts(\frac{\partial p}{\partial T})_v)}{-pv(\frac{\partial p}{\partial T})_v + s(p + v(\frac{\partial p}{\partial v})_T)}$$
37.
$$\left(\frac{\partial u}{\partial g}\right)_v = c_v / \left(-s + v\left(\frac{\partial p}{\partial T}\right)_v\right)$$
38.
$$\left(\frac{\partial u}{\partial g}\right)_T = \frac{-p + T(\frac{\partial p}{\partial T})_v}{v(\frac{\partial p}{\partial v})_T}$$
39.
$$\left(\frac{\partial u}{\partial g}\right)_p = \frac{-(\frac{\partial p}{\partial v})_T c_v + (\frac{\partial p}{\partial T})_v(-p + T(\frac{\partial p}{\partial T})_v)}{s(\frac{\partial p}{\partial v})_T}$$
40.
$$\left(\frac{\partial u}{\partial g}\right)_s = -pc_v / \left(v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)$$
41.
$$\left(\frac{\partial u}{\partial g}\right)_h = \frac{-p(c_v + v(\frac{\partial p}{\partial T})_v) + v(T(\frac{\partial p}{\partial T})_v^2 - (\frac{\partial p}{\partial v})_T c_v)}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$$
42.
$$\left(\frac{\partial u}{\partial g}\right)_f = \frac{p(s + c_v) - Ts(\frac{\partial p}{\partial T})_v}{pv(\frac{\partial p}{\partial T})_v - s(p + v(\frac{\partial p}{\partial v})_T)}$$

5 Differentiale der spezifischen Entropie s

1. $\left(\frac{\partial s}{\partial v}\right)_T = \left(\frac{\partial p}{\partial T}\right)_v$
2. $\left(\frac{\partial s}{\partial v}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(\frac{\partial p}{\partial T}\right)_v}$
3. $\left(\frac{\partial s}{\partial v}\right)_u = p/T$
4. $\left(\frac{\partial s}{\partial v}\right)_h = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T(c_v + v\left(\frac{\partial p}{\partial T}\right)_v)}$
5. $\left(\frac{\partial s}{\partial v}\right)_f = \frac{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}{Ts}$
6. $\left(\frac{\partial s}{\partial v}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - (v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v)}{T(-s + v\left(\frac{\partial p}{\partial T}\right)_v)}$
7. $\left(\frac{\partial s}{\partial T}\right)_v = c_v/T$
8. $\left(\frac{\partial s}{\partial T}\right)_p = \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(\frac{\partial p}{\partial v}\right)_T}$
9. $\left(\frac{\partial s}{\partial T}\right)_u = -pc_v / \left(T\left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
10. $\left(\frac{\partial s}{\partial T}\right)_h = v \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
11. $\left(\frac{\partial s}{\partial T}\right)_f = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{pT}$
12. $\left(\frac{\partial s}{\partial T}\right)_g = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{vT\left(\frac{\partial p}{\partial v}\right)_T}$
13. $\left(\frac{\partial s}{\partial p}\right)_v = c_v / \left(T\left(\frac{\partial p}{\partial T}\right)_v\right)$
14. $\left(\frac{\partial s}{\partial p}\right)_T = \left(\frac{\partial p}{\partial T}\right)_v / \left(\frac{\partial p}{\partial v}\right)_T$
15. $\left(\frac{\partial s}{\partial p}\right)_u = pc_v / \left(T\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)\right)$
16. $\left(\frac{\partial s}{\partial p}\right)_h = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
17. $\left(\frac{\partial s}{\partial p}\right)_f = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{T\left(p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T\right)}$
18. $\left(\frac{\partial s}{\partial p}\right)_g = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{Ts\left(\frac{\partial p}{\partial v}\right)_T}$
19. $\left(\frac{\partial s}{\partial u}\right)_v = 1/T$
20. $\left(\frac{\partial s}{\partial u}\right)_T = \left(\frac{\partial p}{\partial T}\right)_v / \left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
21. $\left(\frac{\partial s}{\partial u}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)}$

22. $\left(\frac{\partial s}{\partial u}\right)_h = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)}$
23. $\left(\frac{\partial s}{\partial u}\right)_f = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{T\left(p(s + c_v) - Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
24. $\left(\frac{\partial s}{\partial u}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{T\left(p(s - v\left(\frac{\partial p}{\partial T}\right)_v) + vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)\right)}$
25. $\left(\frac{\partial s}{\partial h}\right)_v = c_v / \left(T\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
26. $\left(\frac{\partial s}{\partial h}\right)_T = \left(\frac{\partial p}{\partial T}\right)_v / \left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
27. $\left(\frac{\partial s}{\partial h}\right)_p = 1/T$
28. $\left(\frac{\partial s}{\partial h}\right)_u = pc_v / \left(T\left(p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right)\right)$
29. $\left(\frac{\partial s}{\partial h}\right)_f = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{T\left(p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)}$
30. $\left(\frac{\partial s}{\partial h}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{T\left(vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T (s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)\right)}$
31. $\left(\frac{\partial s}{\partial f}\right)_v = -c_v / (Ts)$
32. $\left(\frac{\partial s}{\partial f}\right)_T = -\left(\frac{\partial p}{\partial T}\right)_v / p$
33. $\left(\frac{\partial s}{\partial f}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T\right)}$
34. $\left(\frac{\partial s}{\partial f}\right)_u = pc_v / \left(T\left(-p(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
35. $\left(\frac{\partial s}{\partial f}\right)_h = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)}$
36. $\left(\frac{\partial s}{\partial f}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{T\left(-pv\left(\frac{\partial p}{\partial T}\right)_v + s(p + v\left(\frac{\partial p}{\partial v}\right)_T)\right)}$
37. $\left(\frac{\partial s}{\partial g}\right)_v = c_v / \left(T\left(-s + v\left(\frac{\partial p}{\partial T}\right)_v\right)\right)$
38. $\left(\frac{\partial s}{\partial g}\right)_T = \left(\frac{\partial p}{\partial T}\right)_v / \left(v\left(\frac{\partial p}{\partial v}\right)_T\right)$
39. $\left(\frac{\partial s}{\partial g}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{Ts\left(\frac{\partial p}{\partial v}\right)_T}$
40. $\left(\frac{\partial s}{\partial g}\right)_u = pc_v / \left(T\left(v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v\left(p - T\left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s\left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)\right)\right)$
41. $\left(\frac{\partial s}{\partial g}\right)_h = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T\left(v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
42. $\left(\frac{\partial s}{\partial g}\right)_f = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{T\left(pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)\right)}$

6 Differentiale der spezifischen Enthalpie h

1. $\left(\frac{\partial h}{\partial v}\right)_T = v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v$
2. $\left(\frac{\partial h}{\partial v}\right)_p = \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right) / \left(\frac{\partial p}{\partial T}\right)_v$
3. $\left(\frac{\partial h}{\partial v}\right)_u = \left(p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)\right) / c_v$
4. $\left(\frac{\partial h}{\partial v}\right)_s = v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) / c_v$
5. $\left(\frac{\partial h}{\partial v}\right)_f = \left(-p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / s$
6. $\left(\frac{\partial h}{\partial v}\right)_g = \frac{vT \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T (s+c_v) + Ts \left(\frac{\partial p}{\partial T}\right)_v\right)}{-s + v \left(\frac{\partial p}{\partial T}\right)_v}$
7. $\left(\frac{\partial h}{\partial T}\right)_v = c_v + v \left(\frac{\partial p}{\partial T}\right)_v$
8. $\left(\frac{\partial h}{\partial T}\right)_p = \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) / \left(\frac{\partial p}{\partial v}\right)_T$
9. $\left(\frac{\partial h}{\partial T}\right)_u = \frac{-p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + v \left(T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{-p + T \left(\frac{\partial p}{\partial T}\right)_v}$
10. $\left(\frac{\partial h}{\partial T}\right)_s = v \frac{T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{T \left(\frac{\partial p}{\partial T}\right)_v}$
11. $\left(\frac{\partial h}{\partial T}\right)_f = \left(p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) - s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / p$
12. $\left(\frac{\partial h}{\partial T}\right)_g = \frac{v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts \left(\frac{\partial p}{\partial T}\right)_v}{v \left(\frac{\partial p}{\partial v}\right)_T}$
13. $\left(\frac{\partial h}{\partial p}\right)_v = \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial T}\right)_v$
14. $\left(\frac{\partial h}{\partial p}\right)_T = \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial v}\right)_T$
15. $\left(\frac{\partial h}{\partial p}\right)_u = \frac{p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) + v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)}$
16. $\left(\frac{\partial h}{\partial p}\right)_s = v$
17. $\left(\frac{\partial h}{\partial p}\right)_f = \frac{p \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) - s \left(v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T}$
18. $\left(\frac{\partial h}{\partial p}\right)_g = \frac{v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts \left(\frac{\partial p}{\partial T}\right)_v}{s \left(\frac{\partial p}{\partial v}\right)_T}$
19. $\left(\frac{\partial h}{\partial u}\right)_v = \left(c_v + v \left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
20. $\left(\frac{\partial h}{\partial u}\right)_T = \frac{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}{-p + T \left(\frac{\partial p}{\partial T}\right)_v}$
21. $\left(\frac{\partial h}{\partial u}\right)_p = \frac{T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}$

22. $\left(\frac{\partial h}{\partial u}\right)_s = v \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{pc_v}$
23. $\left(\frac{\partial h}{\partial u}\right)_f = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{p(s + c_v) - Ts\left(\frac{\partial p}{\partial T}\right)_v}$
24. $\left(\frac{\partial h}{\partial u}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{p\left(s - v\left(\frac{\partial p}{\partial T}\right)_v\right) + vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
25. $\left(\frac{\partial h}{\partial s}\right)_v = T\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
26. $\left(\frac{\partial h}{\partial s}\right)_T = \left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial T}\right)_v$
27. $\left(\frac{\partial h}{\partial s}\right)_p = T$
28. $\left(\frac{\partial h}{\partial s}\right)_u = T \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{pc_v}$
29. $\left(\frac{\partial h}{\partial s}\right)_f = T \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}$
30. $\left(\frac{\partial h}{\partial s}\right)_g = T \frac{-v\left(\frac{\partial p}{\partial v}\right)_T(s + c_v) + T\left(\frac{\partial p}{\partial T}\right)_v(-s + v\left(\frac{\partial p}{\partial T}\right)_v)}{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
31. $\left(\frac{\partial h}{\partial f}\right)_v = -\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) / s$
32. $\left(\frac{\partial h}{\partial f}\right)_T = -\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right) / p$
33. $\left(\frac{\partial h}{\partial f}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T}$
34. $\left(\frac{\partial h}{\partial f}\right)_u = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{-p(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
35. $\left(\frac{\partial h}{\partial f}\right)_s = v \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
36. $\left(\frac{\partial h}{\partial f}\right)_g = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{-pv\left(\frac{\partial p}{\partial T}\right)_v + s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}$
37. $\left(\frac{\partial h}{\partial g}\right)_v = \frac{c_v + v\left(\frac{\partial p}{\partial T}\right)_v}{-s + v\left(\frac{\partial p}{\partial T}\right)_v}$
38. $\left(\frac{\partial h}{\partial g}\right)_T = \frac{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}{v\left(\frac{\partial p}{\partial v}\right)_T}$
39. $\left(\frac{\partial h}{\partial g}\right)_p = \frac{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}{s\left(\frac{\partial p}{\partial v}\right)_T}$
40. $\left(\frac{\partial h}{\partial g}\right)_u = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v(p - T\left(\frac{\partial p}{\partial T}\right)_v)\right) + s(-p + T\left(\frac{\partial p}{\partial T}\right)_v)}$
41. $\left(\frac{\partial h}{\partial g}\right)_s = v \frac{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
42. $\left(\frac{\partial h}{\partial g}\right)_f = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}$

7 Differentiale der spezifischen freien Energie f

1. $\left(\frac{\partial f}{\partial v}\right)_T = -p$
2. $\left(\frac{\partial f}{\partial v}\right)_p = \left(-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T\right) / \left(\frac{\partial p}{\partial T}\right)_v$
3. $\left(\frac{\partial f}{\partial v}\right)_u = \left(-p(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
4. $\left(\frac{\partial f}{\partial v}\right)_s = \left(-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
5. $\left(\frac{\partial f}{\partial v}\right)_h = \frac{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}{c_v + v\left(\frac{\partial p}{\partial T}\right)_v}$
6. $\left(\frac{\partial f}{\partial v}\right)_g = \frac{-pv\left(\frac{\partial p}{\partial T}\right)_v + s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{-s + v\left(\frac{\partial p}{\partial T}\right)_v}$
7. $\left(\frac{\partial f}{\partial T}\right)_v = -s$
8. $\left(\frac{\partial f}{\partial T}\right)_p = \left(p\left(\frac{\partial p}{\partial T}\right)_v - s\left(\frac{\partial p}{\partial v}\right)_T\right) / \left(\frac{\partial p}{\partial v}\right)_T$
9. $\left(\frac{\partial f}{\partial T}\right)_u = \frac{p(s + c_v) - Ts\left(\frac{\partial p}{\partial T}\right)_v}{-p + T\left(\frac{\partial p}{\partial T}\right)_v}$
10. $\left(\frac{\partial f}{\partial T}\right)_s = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{T\left(\frac{\partial p}{\partial T}\right)_v}$
11. $\left(\frac{\partial f}{\partial T}\right)_h = \frac{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}{v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v}$
12. $\left(\frac{\partial f}{\partial T}\right)_g = \frac{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{v\left(\frac{\partial p}{\partial v}\right)_T}$
13. $\left(\frac{\partial f}{\partial p}\right)_v = -s / \left(\frac{\partial p}{\partial T}\right)_v$
14. $\left(\frac{\partial f}{\partial p}\right)_T = -p / \left(\frac{\partial p}{\partial v}\right)_T$
15. $\left(\frac{\partial f}{\partial p}\right)_u = \frac{-p(s + c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)}$
16. $\left(\frac{\partial f}{\partial p}\right)_s = \frac{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
17. $\left(\frac{\partial f}{\partial p}\right)_h = \frac{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}{-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
18. $\left(\frac{\partial f}{\partial p}\right)_g = \frac{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{s\left(\frac{\partial p}{\partial v}\right)_T}$
19. $\left(\frac{\partial f}{\partial u}\right)_v = -s / c_v$
20. $\left(\frac{\partial f}{\partial u}\right)_T = -p / \left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
21. $\left(\frac{\partial f}{\partial u}\right)_p = \frac{-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T}{-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (-p + T\left(\frac{\partial p}{\partial T}\right)_v)}$

22. $\left(\frac{\partial f}{\partial u}\right)_s = \frac{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}{pc_v}$
23. $\left(\frac{\partial f}{\partial u}\right)_h = \frac{-p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{-p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
24. $\left(\frac{\partial f}{\partial u}\right)_g = \frac{-pv\left(\frac{\partial p}{\partial T}\right)_v + s\left(p + v\left(\frac{\partial p}{\partial v}\right)_T\right)}{p\left(s - v\left(\frac{\partial p}{\partial T}\right)_v\right) + vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
25. $\left(\frac{\partial f}{\partial s}\right)_v = -Ts/c_v$
26. $\left(\frac{\partial f}{\partial s}\right)_T = -p/\left(\frac{\partial p}{\partial T}\right)_v$
27. $\left(\frac{\partial f}{\partial s}\right)_p = T\frac{-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T}{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}$
28. $\left(\frac{\partial f}{\partial s}\right)_u = T\frac{-p(s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{pc_v}$
29. $\left(\frac{\partial f}{\partial s}\right)_h = T\frac{-p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
30. $\left(\frac{\partial f}{\partial s}\right)_g = T\frac{-pv\left(\frac{\partial p}{\partial T}\right)_v + s\left(p + v\left(\frac{\partial p}{\partial v}\right)_T\right)}{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
31. $\left(\frac{\partial f}{\partial h}\right)_v = -s/\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right)$
32. $\left(\frac{\partial f}{\partial h}\right)_T = -p/\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
33. $\left(\frac{\partial f}{\partial h}\right)_p = \frac{-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T}{T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v}$
34. $\left(\frac{\partial f}{\partial h}\right)_u = \frac{-p(s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
35. $\left(\frac{\partial f}{\partial h}\right)_s = \frac{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
36. $\left(\frac{\partial f}{\partial h}\right)_g = \frac{-pv\left(\frac{\partial p}{\partial T}\right)_v + s\left(p + v\left(\frac{\partial p}{\partial v}\right)_T\right)}{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T (s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}$
37. $\left(\frac{\partial f}{\partial g}\right)_v = -s/\left(-s + v\left(\frac{\partial p}{\partial T}\right)_v\right)$
38. $\left(\frac{\partial f}{\partial g}\right)_T = -p/\left(v\left(\frac{\partial p}{\partial v}\right)_T\right)$
39. $\left(\frac{\partial f}{\partial g}\right)_p = \frac{-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T}{s\left(\frac{\partial p}{\partial v}\right)_T}$
40. $\left(\frac{\partial f}{\partial g}\right)_u = \frac{-p(s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)\right) + s\left(-p + T\left(\frac{\partial p}{\partial T}\right)_v\right)}$
41. $\left(\frac{\partial f}{\partial g}\right)_s = \frac{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
42. $\left(\frac{\partial f}{\partial g}\right)_h = \frac{-p\left(c_v + v\left(\frac{\partial p}{\partial T}\right)_v\right) + s\left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$

8 Differentiale der spezifischen freien Enthalpie g

1. $\left(\frac{\partial g}{\partial v}\right)_T = v \left(\frac{\partial p}{\partial v}\right)_T$
2. $\left(\frac{\partial g}{\partial v}\right)_p = s \left(\frac{\partial p}{\partial v}\right)_T / \left(\frac{\partial p}{\partial T}\right)_v$
3. $\left(\frac{\partial g}{\partial v}\right)_u = \left(v \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) / c_v$
4. $\left(\frac{\partial g}{\partial v}\right)_s = \left(v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + T s \left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
5. $\left(\frac{\partial g}{\partial v}\right)_h = \frac{v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + T s \left(\frac{\partial p}{\partial T}\right)_v}{c_v + v \left(\frac{\partial p}{\partial T}\right)_v}$
6. $\left(\frac{\partial g}{\partial v}\right)_f = \left(-p v \left(\frac{\partial p}{\partial T}\right)_v + s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)\right) / s$
7. $\left(\frac{\partial g}{\partial T}\right)_v = -s + v \left(\frac{\partial p}{\partial T}\right)_v$
8. $\left(\frac{\partial g}{\partial T}\right)_p = -s$
9. $\left(\frac{\partial g}{\partial T}\right)_u = \frac{p \left(s - v \left(\frac{\partial p}{\partial T}\right)_v\right) + v T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v\right)}{-p + T \left(\frac{\partial p}{\partial T}\right)_v}$
10. $\left(\frac{\partial g}{\partial T}\right)_s = \frac{v T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T c_v + T s \left(\frac{\partial p}{\partial T}\right)_v\right)}{T \left(\frac{\partial p}{\partial T}\right)_v}$
11. $\left(\frac{\partial g}{\partial T}\right)_h = \frac{v T \left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v \left(\frac{\partial p}{\partial v}\right)_T (s + c_v) + T s \left(\frac{\partial p}{\partial T}\right)_v\right)}{v \left(\frac{\partial p}{\partial v}\right)_T + T \left(\frac{\partial p}{\partial T}\right)_v}$
12. $\left(\frac{\partial g}{\partial T}\right)_f = \left(p v \left(\frac{\partial p}{\partial T}\right)_v - s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)\right) / p$
13. $\left(\frac{\partial g}{\partial p}\right)_v = \left(-s + v \left(\frac{\partial p}{\partial T}\right)_v\right) / \left(\frac{\partial p}{\partial T}\right)_v$
14. $\left(\frac{\partial g}{\partial p}\right)_T = v$
15. $\left(\frac{\partial g}{\partial p}\right)_u = \frac{v \left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)\right) + s \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)}{\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(p - T \left(\frac{\partial p}{\partial T}\right)_v\right)}$
16. $\left(\frac{\partial g}{\partial p}\right)_s = \frac{v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + T s \left(\frac{\partial p}{\partial T}\right)_v}{-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
17. $\left(\frac{\partial g}{\partial p}\right)_h = \frac{v \left(-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s + c_v)\right) + T s \left(\frac{\partial p}{\partial T}\right)_v}{-T \left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v}$
18. $\left(\frac{\partial g}{\partial p}\right)_f = \frac{p v \left(\frac{\partial p}{\partial T}\right)_v - s \left(p + v \left(\frac{\partial p}{\partial v}\right)_T\right)}{p \left(\frac{\partial p}{\partial T}\right)_v - s \left(\frac{\partial p}{\partial v}\right)_T}$
19. $\left(\frac{\partial g}{\partial u}\right)_v = \left(-s + v \left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
20. $\left(\frac{\partial g}{\partial u}\right)_T = v \left(\frac{\partial p}{\partial v}\right)_T / \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)$
21. $\left(\frac{\partial g}{\partial u}\right)_p = s \left(\frac{\partial p}{\partial v}\right)_T / \left(-\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v \left(-p + T \left(\frac{\partial p}{\partial T}\right)_v\right)\right)$

22. $\left(\frac{\partial g}{\partial u}\right)_s = \frac{vT\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(v\left(\frac{\partial p}{\partial v}\right)_T c_v + Ts\left(\frac{\partial p}{\partial T}\right)_v\right)}{pc_v}$
23. $\left(\frac{\partial g}{\partial u}\right)_h = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
24. $\left(\frac{\partial g}{\partial u}\right)_f = \frac{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{p(s+c_v) - Ts\left(\frac{\partial p}{\partial T}\right)_v}$
25. $\left(\frac{\partial g}{\partial s}\right)_v = T\left(-s + v\left(\frac{\partial p}{\partial T}\right)_v\right) / c_v$
26. $\left(\frac{\partial g}{\partial s}\right)_T = v\left(\frac{\partial p}{\partial v}\right)_T / \left(\frac{\partial p}{\partial T}\right)_v$
27. $\left(\frac{\partial g}{\partial s}\right)_p = Ts\left(\frac{\partial p}{\partial v}\right)_T / \left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
28. $\left(\frac{\partial g}{\partial s}\right)_u = T \frac{p(-s + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(\frac{\partial p}{\partial v}\right)_T c_v + T\left(\frac{\partial p}{\partial T}\right)_v (s - v\left(\frac{\partial p}{\partial T}\right)_v)}{pc_v}$
29. $\left(\frac{\partial g}{\partial s}\right)_h = T \frac{v\left(\frac{\partial p}{\partial v}\right)_T (s+c_v) + T\left(\frac{\partial p}{\partial T}\right)_v (s - v\left(\frac{\partial p}{\partial T}\right)_v)}{v\left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
30. $\left(\frac{\partial g}{\partial s}\right)_f = T \frac{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{pc_v - Ts\left(\frac{\partial p}{\partial T}\right)_v}$
31. $\left(\frac{\partial g}{\partial h}\right)_v = \frac{-s + v\left(\frac{\partial p}{\partial T}\right)_v}{c_v + v\left(\frac{\partial p}{\partial T}\right)_v}$
32. $\left(\frac{\partial g}{\partial h}\right)_T = v\left(\frac{\partial p}{\partial v}\right)_T / \left(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v\right)$
33. $\left(\frac{\partial g}{\partial h}\right)_p = s\left(\frac{\partial p}{\partial v}\right)_T / \left(T\left(\frac{\partial p}{\partial T}\right)_v^2 - \left(\frac{\partial p}{\partial v}\right)_T c_v\right)$
34. $\left(\frac{\partial g}{\partial h}\right)_u = \frac{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)\right) + s(-p + T\left(\frac{\partial p}{\partial T}\right)_v)}{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
35. $\left(\frac{\partial g}{\partial h}\right)_s = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right)}$
36. $\left(\frac{\partial g}{\partial h}\right)_f = \frac{pv\left(\frac{\partial p}{\partial T}\right)_v - s(p + v\left(\frac{\partial p}{\partial v}\right)_T)}{p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) - s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}$
37. $\left(\frac{\partial g}{\partial f}\right)_v = \left(s - v\left(\frac{\partial p}{\partial T}\right)_v\right) / s$
38. $\left(\frac{\partial g}{\partial f}\right)_T = -v\left(\frac{\partial p}{\partial v}\right)_T / p$
39. $\left(\frac{\partial g}{\partial f}\right)_p = s\left(\frac{\partial p}{\partial v}\right)_T / \left(-p\left(\frac{\partial p}{\partial T}\right)_v + s\left(\frac{\partial p}{\partial v}\right)_T\right)$
40. $\left(\frac{\partial g}{\partial f}\right)_u = \frac{v\left(\left(\frac{\partial p}{\partial v}\right)_T c_v + \left(\frac{\partial p}{\partial T}\right)_v (p - T\left(\frac{\partial p}{\partial T}\right)_v)\right) + s(-p + T\left(\frac{\partial p}{\partial T}\right)_v)}{-p(s+c_v) + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
41. $\left(\frac{\partial g}{\partial f}\right)_s = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T c_v\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{-pc_v + Ts\left(\frac{\partial p}{\partial T}\right)_v}$
42. $\left(\frac{\partial g}{\partial f}\right)_h = \frac{v\left(-T\left(\frac{\partial p}{\partial T}\right)_v^2 + \left(\frac{\partial p}{\partial v}\right)_T (s+c_v)\right) + Ts\left(\frac{\partial p}{\partial T}\right)_v}{-p(c_v + v\left(\frac{\partial p}{\partial T}\right)_v) + s(v\left(\frac{\partial p}{\partial v}\right)_T + T\left(\frac{\partial p}{\partial T}\right)_v)}$