

**[tex19] Thermodynamics of an ideal paramagnet I**

For an ideal paramagnet specified by the equation of state  $M = H/T$  (Curie law) and internal energy  $U = 0$ , find (a) the entropy  $S(T, H)$ , (b) the thermodynamic potentials  $E(S, H)$ ,  $A(T, M)$ ,  $G(T, H)$ , and (c) the response functions  $C_M, C_H, \chi_T, \chi_S, \alpha_H$ .

**Solution:**