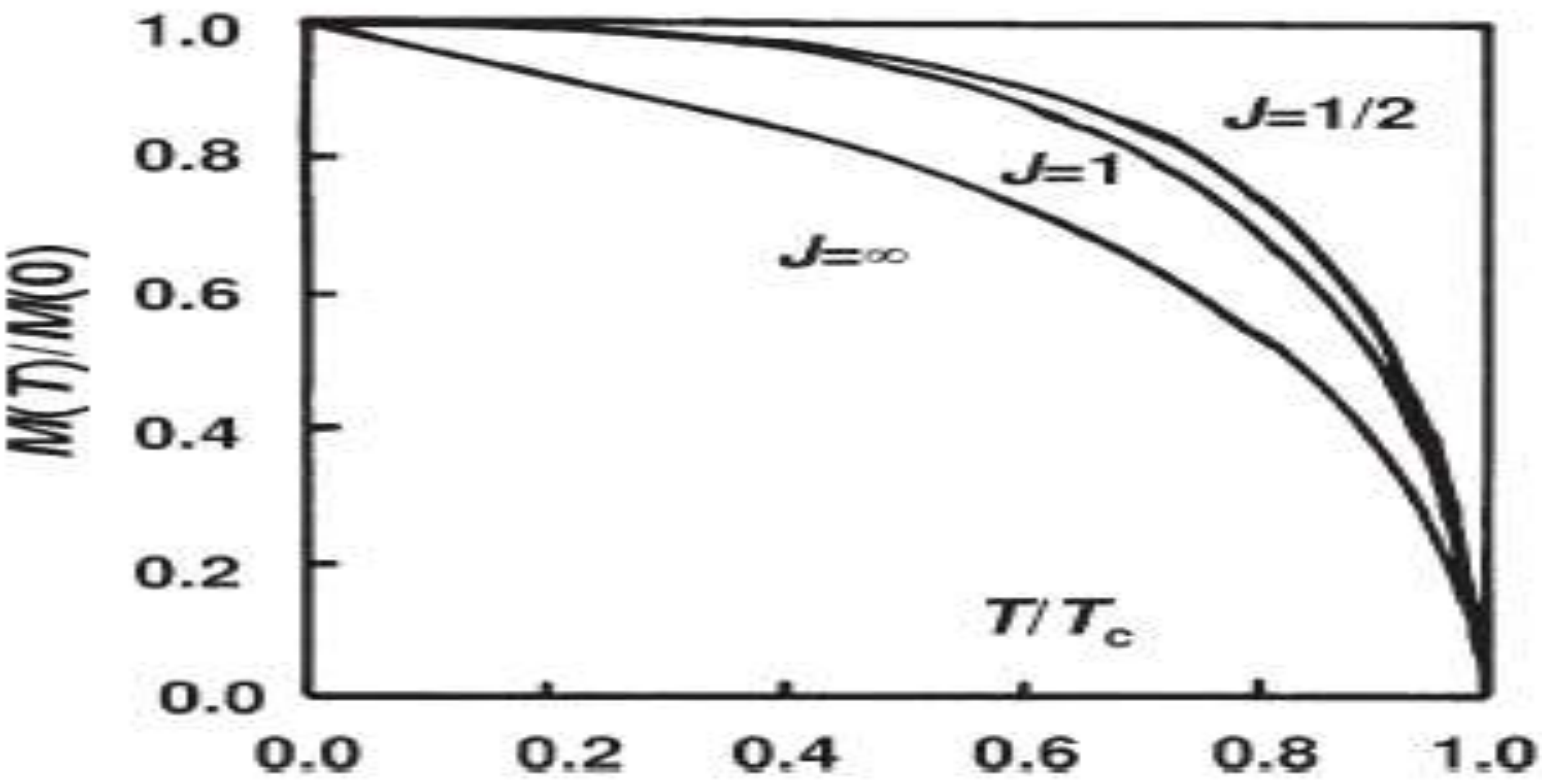

Figure 1 Spontaneous magnetization for $J = 1/2$, $J = 1$, and $J = \infty$.

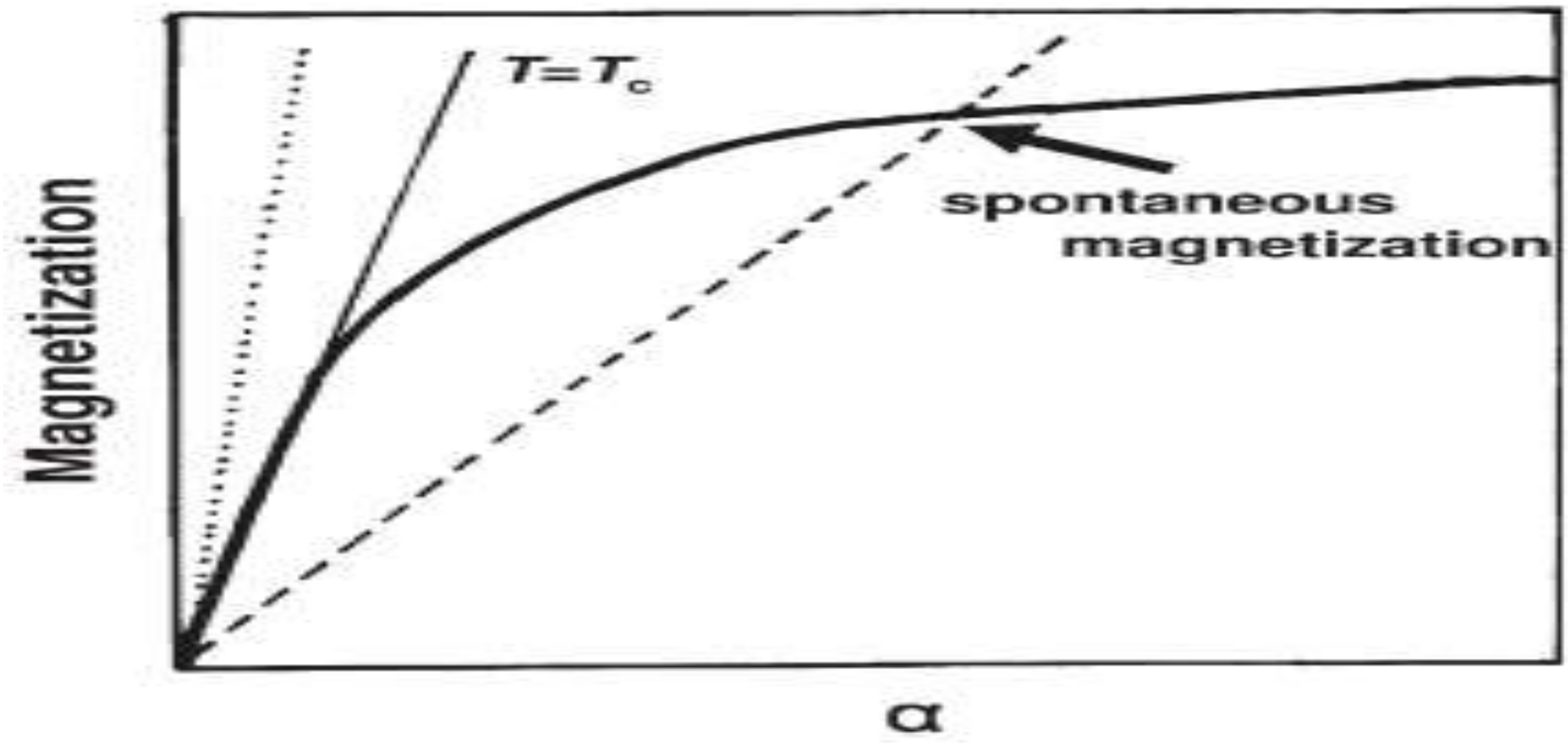

Figure 2 Graphical illustration of Brillouin function and spontaneous magnetization. At $T > T_c$ the dotted line crosses only at the origin ($\alpha = 0$) and at $T < T_c$ the dashed line hits at $\alpha \neq 0$. At $T = T_c$ a solid line becomes a tangent.

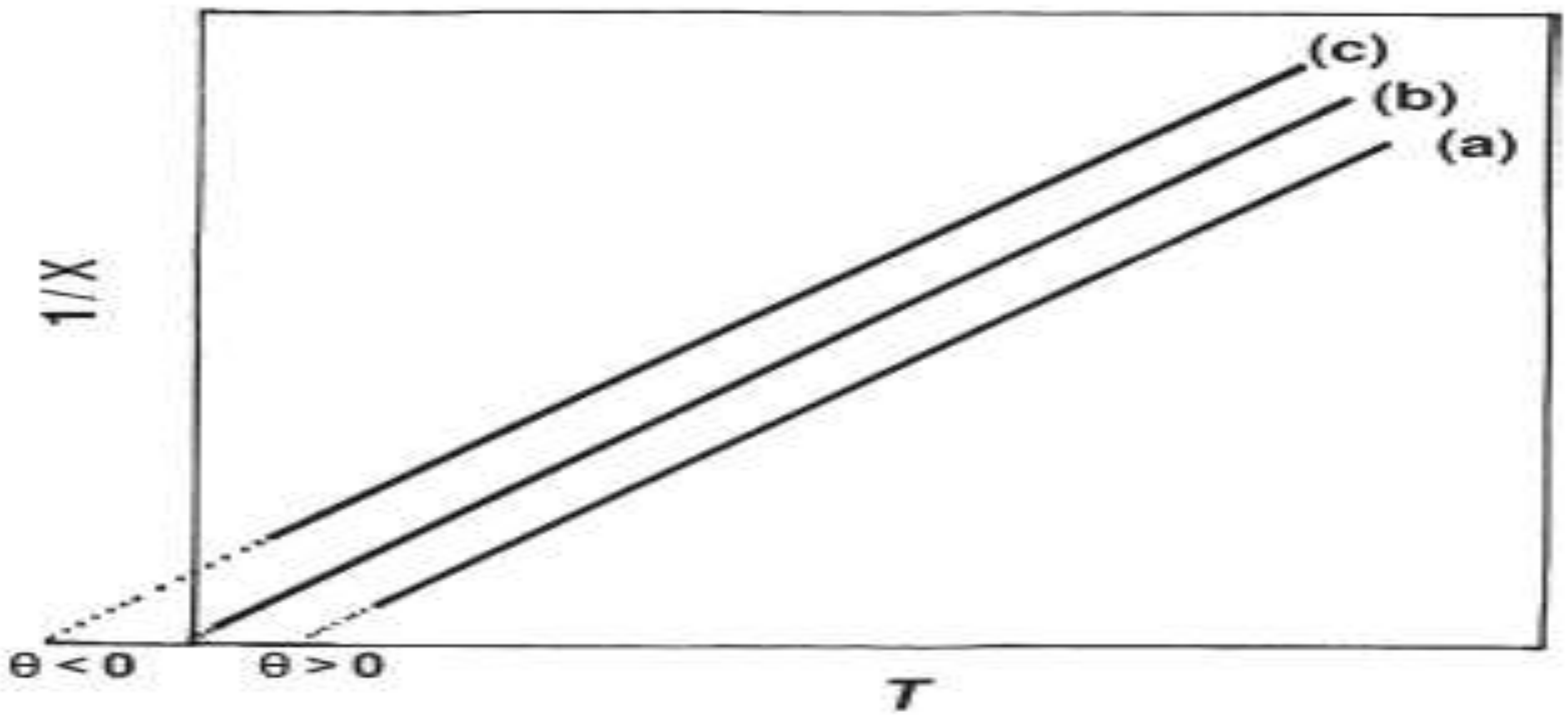

Figure 3 Curie – Weiss laws with (a) θ > 0 and (c) θ < 0 compared with (b) Curie law.

For spontaneous magnetisation H = 0 , hence the form of (7) becomes

$$\chi \;=\; gJ\,\mu_B\,\gamma\,M\,)\,/\,KT$$

$$M = KT\chi\,/\,gJ\,\mu_B\,\gamma \qquad (8)$$

Now a graph is plotted between M and χ . The eq (8) represents a straight line whose slope is proportional to T . The graph is shown in figure 2 .

For $T < T_f$ (Curie point i.e. temperature at and above which spontaneous magnetisation vanishes), the spontaneous magnetisation occurs .

For $T = T_f$ the straight line represented by (8) becomes tangent of the curve .

For $T > T_f$, the spontaneous magnetisation vanishes .

In order to establish a relation between the curie temperature T_f , the spontaneous magnetisation vanishes .