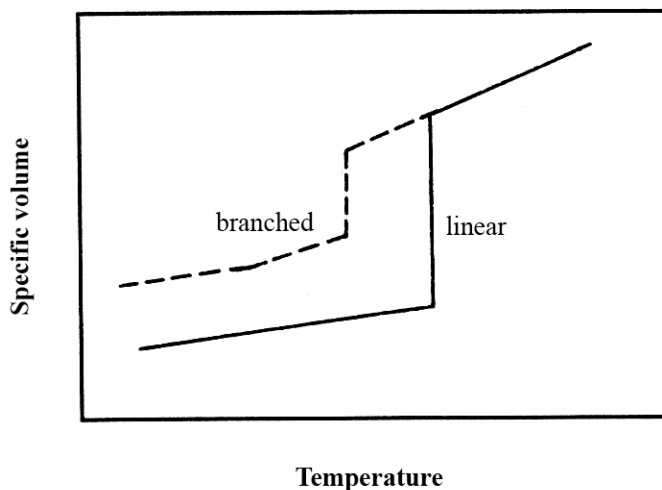


### Factors That Influence Melting and Glass Transition Temperatures

15.30 (a) Shown below are specific volume-versus-temperature curves for the two polyethylene materials. The linear polyethylene will be highly crystalline, and, therefore, will exhibit behavior similar to curve *C* in Figure 15.18. The branched polyethylene will be semicrystalline, and, therefore its curve will appear as curve *B* in this same figure. Furthermore, since the linear polyethylene has the greater molecular weight, it will also have the higher melting temperature.



(b) Shown below are specific volume-versus-temperature curves for the poly(vinyl chloride) and polypropylene materials. Since both are 50% crystalline, they will exhibit behavior similar to curve *B* in Figure 15.18. However, since the polypropylene has the greater molecular weight it will have the higher melting temperature. Furthermore, polypropylene will also have the higher glass-transition temperature inasmuch as its  $\text{CH}_3$  side group is bulkier than the Cl for PVC.

