TABLE 19.1

The Seven Crystal Systems

Crystal System	Minimum Essential Symmetry	Conditions on Unit-Cell Edges and Angles
Hexagonal	One 6-fold rotation	$a = b$; $\alpha = \beta = 90°$, $\gamma = 120°$
Cubic	Four independent 3-fold rotations†	$a = b = c$; $\alpha = \beta = \gamma = 90°$
Tetragonal	One 4-fold rotation	$a = b$; $\alpha = \beta = \gamma = 90°$
Trigonal	One 3-fold rotation	$a = b = c$; $\alpha = \beta = \gamma \neq 90°$
Orthorhombic	Three mutually perpendicular 2-fold rotations	$\alpha = \beta = \gamma = 90°$
Monoclinic	One 2-fold rotation	$\alpha = \gamma = 90°$
Triclinic	No symmetry required	None

† Each of these axes makes 70.53° angles with the other three.

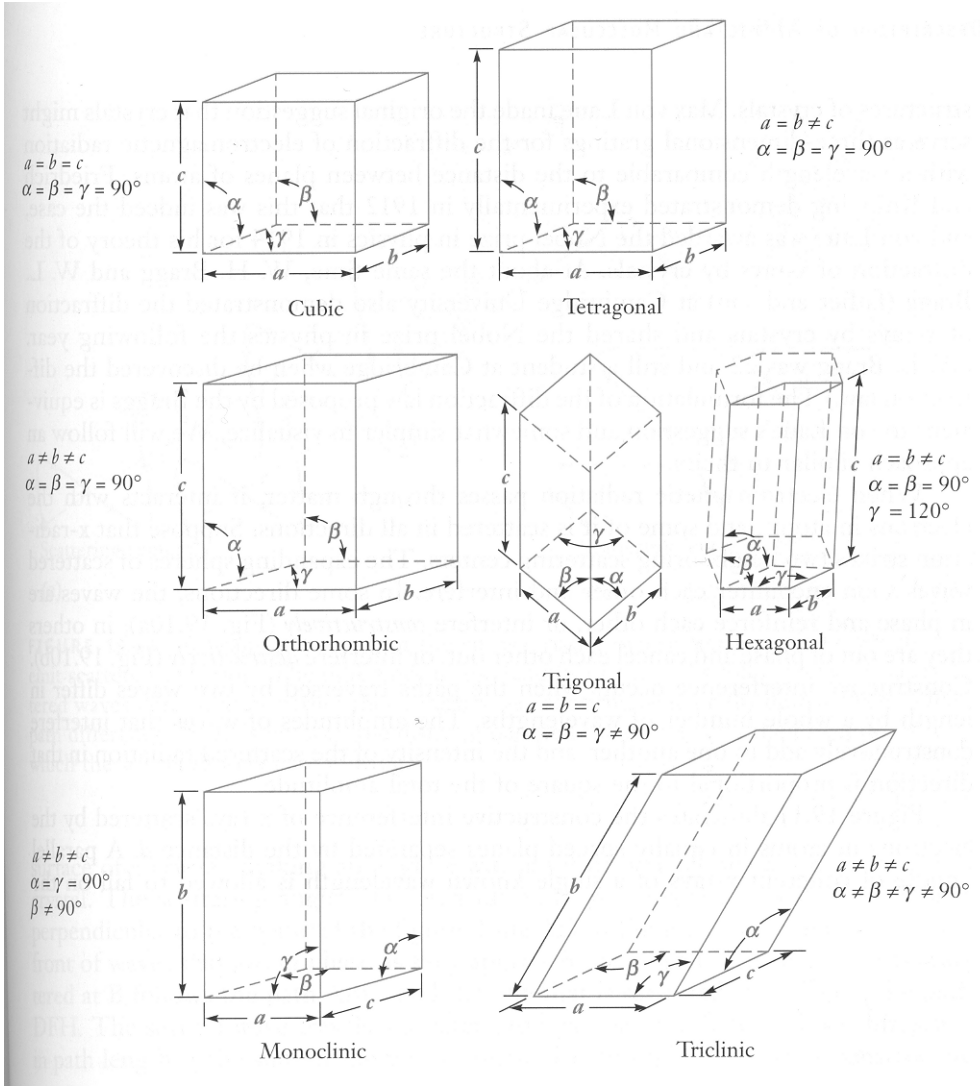

FIGURE 19.6 Shapes of the unit cells in the seven crystal systems. The more symmetric crystal systems have more symmetric cells.