

## ASSIGNMENT #13

- 7.6** (a) Compare planar densities (Section 3.11 and Problem 3.60) for the (100), (110), and (111) planes for FCC.  
(b) Compare planar densities (Problem 3.59) for the (100) and (110) planes for BCC.

**7.8** One slip system for the HCP crystal structure is  $\{0001\}\langle 11\bar{2}0 \rangle$ . In a manner similar to Figure 7.6b, sketch a  $\{0001\}$ -type plane for the HCP structure and, using arrows, indicate three different  $\langle 11\bar{2}0 \rangle$  slip directions within this plane. You may find Figure 3.9 helpful.

**7.14** Consider a single crystal of silver oriented such that a tensile stress is applied along a  $[001]$  direction. If slip occurs on a (111) plane and in a  $[\bar{1}01]$  direction and is initiated at an applied tensile stress of 1.1 MPa (160 psi), compute the critical resolved shear stress.

**7.24** The lower yield point for an iron that has an average grain diameter of  $5 \times 10^{-2}$  mm is 135 MPa (19,500 psi). At a grain diameter of  $8 \times 10^{-3}$  mm, the yield point increases to 260 MPa (37,500 psi). At what grain diameter will the lower yield point be 205 MPa (30,000 psi)?

- 7.31** (a) What is the approximate ductility (%EL) of a brass that has a yield strength of 275 MPa (40,000 psi)?  
(b) What is the approximate Brinell hardness of a 1040 steel having a yield strength of 690 MPa (100,000 psi)?