

3.60 (a) From the data given in the problem, and realizing that $36.12^\circ = 2\theta$, the interplanar spacing for the (311) set of planes for rhodium may be computed using Equation 3.13 as

$$d_{311} = \frac{n\lambda}{2 \sin \theta} = \frac{(1)(0.0711 \text{ nm})}{(2) \left(\sin \frac{36.12^\circ}{2} \right)} = 0.1147 \text{ nm}$$

(b) In order to compute the atomic radius we must first determine the lattice parameter, a , using Equation 3.14, and then R from Equation 3.1 since Rh has an FCC crystal structure. Therefore,

$$a = d_{311} \sqrt{(3)^2 + (1)^2 + (1)^2} = (0.1147 \text{ nm})(\sqrt{11}) = 0.3804 \text{ nm}$$

And, from Equation 3.1

$$R = \frac{a}{2\sqrt{2}} = \frac{0.3804 \text{ nm}}{2\sqrt{2}} = 0.1345 \text{ nm}$$