

4-2)

Basically, what we want is for the two wires to have the same resistance. Since they are 'Play-doh' shapes, we can use

$$R = \frac{\rho L}{A} = \frac{\rho L}{\pi \left(\frac{D}{2}\right)^2} = \frac{4\rho L}{\pi D^2} \cdot$$

Set

$$\frac{4\rho_{Al}L}{\pi D_{Al}^2} = \frac{4\rho_{Ag}L}{\pi D_{Ag}^2}$$

$$\frac{\rho_{Al}}{D_{Al}^2} = \frac{\rho_{Ag}}{D_{Ag}^2}$$

$$D_{Ag} = \sqrt{\frac{\rho_{Ag}}{\rho_{Al}}} D_{Al} = \sqrt{\frac{1.59 \times 10^{-8}}{2.65 \times 10^{-8}}} 0.01 = 0.0077 \text{ m or } 0.8 \text{ cm}$$