Tutorial problems and questions

1. Consider a gold wire of radius 160 microns. It is held at about 1060^0C and it loaded in tension by a suspended weight. For the wire to undergo zero creep (that is neither extension nor contraction due to the suspended weight), a load of 1.48 mN has to be applied (including the weight of the wire). What is the surface tension of gold at this temperature?

   Answer

   The circumference of the gold wire gold is 2πr where r is the radius of the wire. The surface tension acting on this length balanaces the given weight. Hence, we get $2\pi r\gamma = mg$; that is, $\gamma = \frac{mg}{2\pi r}$. This gives the surface tension as 1.473 N/m.