HW 27 #3, 6, 9, 12

3) $n = c/v = \frac{\lambda f}{\frac{1}{4}\lambda f} = \lambda/\lambda_m = \lambda/0.671\lambda = 1/0.671 = 1.49$, probably polystyrene.

6) $d = 0.05e{-3}\,m$, $\lambda = 450e{-9}\,m$

$d\sin\theta = m\lambda$, $\theta = \sin^{-1}\left(\frac{m\lambda}{d}\right) = \sin^{-1}\left(\frac{1\cdot 450e{-9}}{0.05e{-3}}\right) = 0.516^\circ$

9) $d\sin\theta = (m+\frac{1}{2})\lambda$, $d = (m+\frac{1}{2})\lambda / \sin\theta = (0+\frac{1}{2})(410)/\sin(45) = 289.9\,nm$

12) $d = 0.05e{-3}\,m$, $\lambda = 450e{-9}\,m$

$\theta = \sin^{-1}\left(\frac{m\lambda}{d}\right) = \sin^{-1}\left(\frac{4\cdot 450e{-9}}{0.05e{-3}}\right) = 2.06^\circ$