

56. (a) (b) and (c) The index of refraction n for fused quartz is slightly higher on the bluish side of the visible light spectrum (with shorter wavelength). We estimate $n = 1.463$ for blue and $n = 1.456$ for red. Since $\sin \theta_c = 1/n$, the critical angle is slightly smaller for blue than it is for red: $\theta_c = 43.12^\circ$ for blue and $\theta_c = 43.38^\circ$ for red. Thus, at an angle of incidence of, say, $\theta = 43.29^\circ$, the refracted beam would be depleted of blue (and would appear to an outside observer as reddish), and the reflected beam would consequently appear to be bluish (to someone able to observe that beam, the operational details of which are not discussed here).