36. ***REASONING*** Using the value given for the critical angle in Equation 26.4 ($\sin\theta_c = n_2/n_1$), we can obtain the ratio of the refractive indices. Then, using this ratio in Equation 26.5 (Brewster's law), we can obtain Brewster's angle θ_B.

SOLUTION From Equation 26.4, with $n_2 = n_{air} = 1$ and $n_2 = n_{liquid}$, we have

$$\sin\theta_c = \sin 39° = \frac{1}{n_{liquid}} \tag{1}$$

According to Brewster's law,

$$\tan\theta_B = \frac{n_2}{n_1} = \frac{1}{n_{liquid}} \tag{2}$$

Substituting Equation (2) into Equation (1), we find

$$\tan\theta_B = \frac{1}{n_{liquid}} = \sin 39° = 0.63 \qquad \text{or} \qquad \theta_B = \tan^{-1}(0.63) = \boxed{32°}$$