

35. The capacitance with the dielectric in place is given by $C = \kappa C_0$, where C_0 is the capacitance before the dielectric is inserted. The energy stored is given by $U = \frac{1}{2}CV^2 = \frac{1}{2}\kappa C_0V^2$, so

$$\kappa = \frac{2U}{C_0V^2} = \frac{2(7.4 \times 10^{-6} \text{ J})}{(7.4 \times 10^{-12} \text{ F})(652 \text{ V})^2} = 4.7 .$$

According to Table 26-1, you should use Pyrex.