

56. According to Fig. 40-23, the quantum number  $n$  in question satisfies  $r = n^2 a$ . Letting  $r = 1.0 \text{ mm}$ , we solve for  $n$ :

$$n = \sqrt{\frac{r}{a}} = \sqrt{\frac{1.0 \times 10^{-3} \text{ m}}{5.29 \times 10^{-11} \text{ m}}} \approx 4.3 \times 10^3 .$$