Problem 24

The following times are given using metric prefixes on the base SI unit of time: the second. Rewrite them in scientific notation without the prefix. For example, 47 Ts would be rewritten as 4.7×10^{13} s. (a) 980 Ps; (b) 980 fs; (c) 17 ns; (d) 577 μs.

Solution

The prefixes and their meanings are listed in Figure 1.2 on page 17.

$$980 \text{ Ps} = 9.80 \times 10^2 \text{ Ps} \times \frac{10^{15} \text{ s}}{1 \text{ Ps}} = 9.80 \times 10^{17} \text{ s}$$

$$980 \text{ fs} = 9.80 \times 10^2 \text{ fs} \times \frac{1 \text{ s}}{10^{15} \text{ fs}} = 9.80 \times 10^{-13} \text{ s}$$

$$17 \text{ ns} = 1.7 \times 10^1 \text{ ns} \times \frac{1 \text{ s}}{10^{9} \text{ ns}} = 1.7 \times 10^{-8} \text{ s}$$

$$577 \text{ } \mu\text{s} = 5.77 \times 10^2 \text{ } \mu\text{s} \times \frac{1 \text{ s}}{10^{6} \text{ } \mu\text{s}} = 5.77 \times 10^{-4} \text{ s}$$