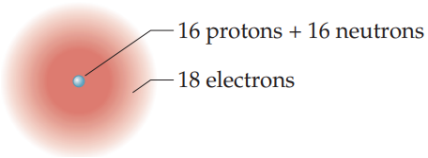
Exercise 2.4

Does the following drawing represent a neutral atom or an ion? Write its complete chemical symbol, including mass number, atomic number, and net charge (if any). [Sections 2.3 and 2.7]



Solution

The drawing represents an ion because the number of protons and electrons is not the same. Since there are two more electrons, there's a net charge of 2−. The number of protons determines the chemical identity: Looking at the periodic table, sulfur (S) is the element with an atomic number of 16. The mass number is the sum of protons and neutrons, $16 + 16 = 32$.

$$^{32}_{16}\mathrm{S}^{2-}$$

This is the complete chemical symbol. On the bottom left is the atomic number (16), on the top left is the mass number (32), and on the top right is the net charge (2−).