#### Particle identification from protons, neutrons, and electrons.

#### In each case, identify the particle.

- **1.** An atom with 8 protons and two fewer of neutrons as a  $^{19}F_9$  atom.
- **2.** An atom with one more proton and four more number of neutrons than an atom of  $^{40}$  Ca.
- 3. An atom with 10 protons and the same number of neutrons as an atom of <sup>24</sup>Mg
- **4.** An atom with one fewer proton and the same number of neutrons as an atom of <sup>66</sup>Zn
- 5. An atom with the same number of protons and two more neutrons as an atom of  $^{72}$ Ge
- **6.** An atom with two fewer protons and two more neutrons as an atom of <sup>50</sup>Cr
- **7.** An ion with one more proton and two more neutrons as an atom of <sup>20</sup>Ne but the same number of electrons
- **8.** An ion with two fewer protons and six fewer neutrons as an atom of <sup>40</sup>Ar but four less electrons
- **9.** An ion with two more protons and two more neutrons as an atom of <sup>60</sup>Ni but the same number of electrons
- **10.** An ion with two more protons and three more neutrons as an atom of <sup>20</sup>Ne but the same number of electrons
- **11.** An ion with one more proton and three more neutrons but the same number of electrons as an ion of <sup>85</sup>Rb<sup>+</sup>
- **12.** A particle with two fewer protons, four fewer neutrons, and the same number of electrons as an atom of <sup>36</sup>Kr
- **13.** A particle with one fewer proton, one fewer neutron, and one more electron as a <sup>44</sup>Ru<sup>2+</sup> ion
- **14.** A particle with one fewer proton, three fewer neutrons, and the same number of electrons as a  $^{127}\text{Xe}^{2+}$  ion

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