

5. Consider atoms of nitrogen, oxygen, and phosphorus. Circle the element that correctly fits the description, then provide a brief explanation (in 1 to 2 sentences) for your choice in terms of atomic structure.

a. (4 pts) (Nitrogen / Oxygen / Phosphorus) has the largest (most negative) electron affinity because...

b. (4 pts) (Nitrogen / Oxygen / Phosphorus) has the largest atomic radius because...

6. (4 pts) The successive ionization energies for an unknown element are:

$$I_1 = 896 \text{ kJ/mol}$$

$$I_2 = 1752 \text{ kJ/mol}$$

$$I_3 = 14,807 \text{ kJ/mol}$$

$$I_4 = 17,948 \text{ kJ/mol}$$

a. (2 pts) Briefly explain why successive ionization energies are increasing.

b. (3 pts) To which family in the periodic table does the unknown element most likely belong? Explain briefly.