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**Question 1 (1 points)** For which of the following reactions is the enthalpy change equal to the second ionization energy of nitrogen?

A. \( \text{N}^{2+}(g) \rightarrow \text{N}^{3+}(g) + \text{e}^- \)  
B. \( \text{N}^{2+}(g) + \text{e}^- \rightarrow \text{N}^+(g) \)  
C. \( \text{N}(g) \rightarrow \text{N}^{2+}(g) + 2\text{e}^- \)  
D. \( \text{N}^-(g) + \text{e}^- \rightarrow \text{N}^2^-(g) \)  
E. \( \text{N}^+(g) \rightarrow \text{N}^{2+}(g) + \text{e}^- \)

**Question 2 (1 points)** The successive ionization energies of a certain element are \( I_1 = 577.9 \text{ kJ/mol}, I_2 = 1820 \text{ kJ/mol}, I_3 = 2750 \text{ kJ/mol}, I_4 = 11,600 \text{ kJ/mol}, \) and \( I_5 = 14,800 \text{ kJ/mol} \). This pattern of ionization energies suggests that the unknown element is

A. K  
B. Al  
C. Cl  
D. Se  
E. Kr

**Question 3 (3 points)** Given the information below for \( \text{MgSO}_3 \), what is the percent of Oxygen in this compound (Report answer to the hundredths place)?

<table>
<thead>
<tr>
<th>Element</th>
<th>MM (g/ mol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mg</td>
<td>24.00</td>
</tr>
<tr>
<td>S</td>
<td>32.00</td>
</tr>
<tr>
<td>O</td>
<td>16.00</td>
</tr>
</tbody>
</table>

\[
\frac{3(16)}{24+32+3(16)} \approx 46.15\%
\]