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| Constructed Response Items C3.1d |
| Calculate the amount of heat produced for a given mass of reactant from a balanced chemical equation. |
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Constructed Response Items for Thermochemistry & Solutions

**C3.1d:** Calculate the amount of heat produced for a given mass of reactant from a balanced chemical equation.

1. The heat of formation of sodium chloride is ΔH= –410.9kJ/mol NaCl under standard conditions. If a reaction produces 1.30 moles of sodium chloride, how much heat will be released as a result?
2. The heat of formation of sodium chloride is ΔH= –410.9kJ/mol NaCl under standard conditions. If a reaction produces 22.00g of sodium chloride, how much heat will be released as a result?
3. In the reaction 2Na(s) + Cl2(g) → 2NaCl(s) + 821.8kJ, if 5.00 moles of sodium chloride are produced, how much heat is released?
4. The heat of reaction for N2(g) + 3H2(g) → 2NH3(g) is 93.8kJ/mol NH3(g). What is ΔH for the production of 300.00g of NH3(g)?
5. Given the reaction for N2(g) + 3H2(g) → 2NH3(g) is 93.8kJ/mol NH3(g), if 500.00g on NH3(g) decompose, what will the heat of reaction be?

Teacher Companion Notes for Constructed Response Items  
 for Thermochemistry & Solutions

**High School Chemistry**

**Question 1:**

**Difficulty:** Low, all students should be able to answer this question correctly.

**Correct answer:** 534kJ will be released.

**Question 2:**

**Difficulty:** Average, a well prepared student should be able to answer this question.

**Correct answer:** 154.7kJ will be released.

**Question 3:**

**Difficulty:** High, this question should challenge the above average student.

**Correct answer:** 2,500kJ will be released.

**Question 4:**

**Difficulty:** High, this question should challenge the above average student.

**Correct answer:** ΔH = –826kJ

**Question 5:**

**Difficulty:** High, this question should challenge the above average student.

**Correct answer:** ΔH = 1,380kJ