Potential energy diagrams

1. **Numerical response question**

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Left justify your answer in the boxes provided.

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| Consider the following potential energy diagram below.  Exothermic Reaction for the combustion of a gas      Alyson looks carefully at the numbers on the diagram.  She interprets that four numbers can be used to identify   * The position of reactants * The position of the products * The arrow that represents the activation energy * The arrow that represents the enthalpy change of the reaction.   The four numbers (in the order given) are \_\_\_, \_\_\_, \_\_\_ and \_\_\_ |

1. **Numerical response question**

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Left justify your answer in the boxes provided.

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| Consider the following energy diagram  Enthalpy of Formation for Iron (III) oxide    The energy absorbed when 0.375 mol of Fe2O3(s) decomposes to form Fe(s) and O2(g) is \_\_\_\_\_\_\_ kJ. |

1. A student dissolves some NaCl(s) in a beaker of water. This process is represented by the equation

**NaCl(s) 🡪 Na+(aq) + Cl-(aq)**

The following observations were made:

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| Initial temperature of water | 21.2 oC |
| Final temperature of water | 19.6 oC |

Based on this data, which conclusion is justified?

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| a | The reaction has a negative ΔH value |
| b | The potential energy of 1 mol of NaCl(s) is lower than  the combined potential energy of one mole of Na+(aq) and Cl-(aq). |
| c | The potential energy of 1 mol of NaCl(s) is higher than  the combined potential energy of one mole of Na+(aq) and Cl-(aq). |
| d | Dissolving NaCl(s) in water is exothermic. |

1. Use the following diagram to answer the next question.

Formation of a compound

Potential energy

kJ

Reaction coordinate

The graph above could represent the formation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |
| --- | --- |
| a | Ethane |
| b | Ethanol |
| c | Ethene |
| d | Ethanoic acid |

1. Shane and Tim sketch a potential energy diagram and note that the activation energy for the forward reaction is 96 kJ of energy.

Justin looks at their diagram and observes that the activation energy for the REVERSE reaction is 42 kJ. Based on this information, David says the ΔH for the forward reaction is \_\_\_\_\_\_\_kJ.

|  |  |
| --- | --- |
| a | -138 |
| b | +138 |
| c | +54 |
| d | -54 |

Solutions:

1. 1526
2. 309
3. B
4. C
5. C