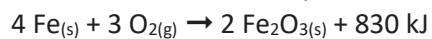
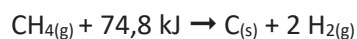


1) The reaction below represents the reaction between iron and oxygen gas to produce iron (III) oxide:



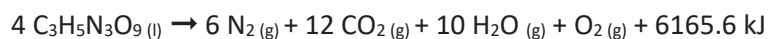
If 50.0 g of iron is reacted completely with enough oxygen, how much energy will be released?

2) The decomposition of methane (CH<sub>4</sub>) takes place according to the following equation:



How much energy does it take to decompose 20.00 g of methane?

3) Nitroglycerin breaks down according to the following equation:



How much nitroglycerin is needed to obtain 10,000 kJ?

Promise me you'll always remember: You're braver than you believe, and stronger than you seem, and smarter than you think.

– A. A. Milne

4) Ricardo dissolves 9.60 g of potassium nitrate in 0.500 L of water at 24.50 °C.

He then notes that the temperature drops by 1.50 °C.

- a) What is the molar heat of dissolution of potassium nitrate if we rely on Ricardo's results?
- b) What is the percentage error from the theoretical value if the accepted value of the molar heat of dissolution of potassium nitrate is  $\Delta H = 34.9 \text{ kJ / mol}$ ?

5) Karina mixes 200.0 ml of sodium hydroxide (NaOH) at 1.00 mol / L with 100.0 ml of nitric acid (HNO<sub>3</sub>) at 2.00 mol /L.

She then notices that the solution temperature rises from 23.4 °C to 35.4 °C.

What is the molar heat of neutralization for nitric acid if the latter has been fully neutralized?

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– A. A. Milne