**ANSWERS: Additional questions on enthalpy change calculations**

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| 1. i) 2 moles of Mg gives out 1200k J of energyso, 1 moles of Mg gives out 600kJ of energyii) 0.35 moles of Mg gives out 600 x 0.35 = 210kJiii) 1 mole of Mg = 24g mol-1so, 24g = 600kJ of energy released1.5g will release (600 x 1.5)/24 = 37.5kJ of energy**3.** 1640kJ needed = ? moles of sucrose needed 5650/1640 = 3.445 moles 1 mole sucrose = 342gmol-1so 3.445 moles sucrose = 342 x 3.445 = 1178.19g | 2. i) M(Al) = 27 g mol-12.1g of Al releases 70.3kJ of energy1g of Al releases 70.3/2.1 = 33.476kJso 27g of Al releases 27 x 33.47 = 903.857kJii) 1 mole of Al releases 903.857kJratio of Al : Fe in the equation is 1:1so, 1 mole of Fe also releases 903.857kJ? moles of Fe releases 240kJ240/903.857 = 0.2655moles1 mole Fe = 55.9gmol-1 0.2655 Fe = ? g = 0.2655 x 55.9 = 14.84g |
| 5. 1 mole of propane releases 2220kJ of energy0.256moles = 0.256 x -2220 = -568.32kJ | 4. M (C8H18) = 114density = mass volumeso mass of petrol burnt = density x volume = 0.698 x 40 x 1000 (to convert to cm3) = 27920g114g of petrol = 5530 kJ mol–127920g of petrol = ?The energy released = 27920/114 x 5530 = 1.35 x 106 kJ |
| 6. **density = mass** **volume****so, the mass of ethanoic acid is 1.05 x 1.5 x 1000 (to convert dm3 to cm3) = 1575g****1 mole of ethanoic acid = 60 g****? moles = 1575g = 1575/60 = 26.25moles****1 mole ethanoic acid produced liberates 356kJ of energy****so, 26.25 moles = 26.25 x 356 = 9345kJ of energy** | **ii) 1 mole of ethanoic acid releases 356kJ of energy****? moles of ethanoic acid releases 3 x 104 kJ of energy = 3 x 104/356 = 84.269 moles****1 mole of ethanoic acid = 60g****84.269 moles = ? g = 60 x 84.269 = 5056.14g****density = mass** **volume****so volume = mass = 5056.14/1.05 = 4815.371cm3 = 4.82dm3 or 4.82L** **density** |

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