

Dr Sean's Chemistry Class

Way to SUCCESS

The Periodic Table of the Elements

1 H Hydrogen 1.00794																	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012182											5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.00674	8 O Oxygen 15.9994	9 F Fluorine 18.9984032	10 Ne Neon 20.1797
11 Na Sodium 22.989770	12 Mg Magnesium 24.3050											13 Al Aluminum 26.981538	14 Si Silicon 28.0855	15 P Phosphorus 30.973761	16 S Sulfur 32.066	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.955910	22 Ti Titanium 47.867	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938049	26 Fe Iron 55.845	27 Co Cobalt 58.933200	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.92160	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.90550	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.760	52 Te Tellurium 127.60	53 I Iodine 126.90447	54 Xe Xenon 131.29
55 Cs Cesium 132.90545	56 Ba Barium 137.327	57 La Lanthanum 138.9055	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.078	79 Au Gold 196.96655	80 Hg Mercury 200.59	81 Tl Thallium 204.3833	82 Pb Lead 207.2	83 Bi Bismuth 208.98038	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (263)	107 Bh Bohrium (262)	108 Hs Hassium (265)	109 Mt Meitnerium (266)	110 (269)	111 (272)	112 (277)	113	114				
		58 Ce Cerium 140.116	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967		
		90 Th Thorium 232.0381	91 Pa Protactinium 231.03588	92 U Uranium 238.0289	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)		

Dr Sean Chemistry

DSE Challenge by
Dr Sean Chemistry

Topic 8 Chemical Reactions and Energy



You have 25 mins to complete 10 Questions.

- Which of the following is the correct equation for the standard enthalpy change of formation of water?

Level 3

- $\text{H}_2(\text{g}) + 1/2\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{g})$
- $\text{H}_2(\text{g}) + 1/2\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$
- $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$
- $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$

- Which of the following is the correct equation for the standard enthalpy change of neutralization between sulphuric acid and sodium hydroxide solution?

Level 4

- $\text{H}_2\text{SO}_4(\text{aq}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Na}_2\text{SO}_4(\text{aq}) + 2\text{H}_2\text{O}(\text{l})$
- $1/2\text{H}_2\text{SO}_4(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow 1/2\text{Na}_2\text{SO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- $2\text{H}^+(\text{aq}) + 2\text{OH}^-(\text{aq}) \rightarrow 2\text{H}_2\text{O}(\text{l})$
- None of the above

- 0.46 g of ethanol was completely burnt to heat 500 cm³ of water. The temperature of water was increased by 6.4 °C. Calculate the enthalpy change for the combustion of ethanol. (Specific heat capacity of water: 4.18 J g⁻¹ °C⁻¹, relative molecular mass of ethanol: 46)

Level 4

- +1340 kJ mol⁻¹
- 1340 kJ mol⁻¹
- +1230 kJ mol⁻¹
- 1230 kJ mol⁻¹

4. 0.86 g of hexane was completely burnt in a well-insulated bomb calorimeter. The temperature of the calorimeter was increased by 20 °C. Given the standard enthalpy change for the combustion of hexane is $-4160 \text{ kJ mol}^{-1}$, calculate the energy needed for increasing the temperature of the calorimeter by 1 °C. (relative molecular mass of hexane: 86)

Level 5

- A. 500 J
B. 2080 J
C. 2420 J
D. Cannot be determined.

5. 0.327 g of zinc was reacted with 50 cm³ of 0.16 mol dm⁻³ silver nitrate solution. The temperature of the resulting solution increased by 4.1 °C. Calculate the enthalpy change for the reaction between zinc and silver nitrate solution. (Specific heat capacity of the reaction mixture: $4.18 \text{ J g}^{-1} \text{ °C}^{-1}$, relative atomic mass of zinc: 65.4)



Level 5*-5**

- A. $+107 \text{ kJ mol}^{-1}$
B. -107 kJ mol^{-1}
C. -171 kJ mol^{-1}
D. -214 kJ mol^{-1}

6. 25 cm^3 of 0.50 mol dm^{-3} of sulphuric acid was reacted with 25 cm^3 of 1.50 mol dm^{-3} of sodium hydroxide solution. The temperature of the resulting solution was increased by 6.8°C , calculate the enthalpy change for the neutralization between sulphuric acid and sodium hydroxide solution. (Specific heat capacity of the reaction mixture: 4.18)

Level 5

- A. $+28 \text{ kJ mol}^{-1}$
B. -28 kJ mol^{-1}
C. -57 kJ mol^{-1}
D. -114 kJ mol^{-1}

7. A student conducted an experiment to determine the enthalpy change for the combustion of ethanol. However, the magnitude of the experimental value he found was lower than the theoretical value. Which of the following are the possible reason?

- 1) Heat is lost to the surrounding during the experiment.
- 2) The combustion of ethanol is incomplete.
- 3) The ethanol sample contains some methanol impurities.

Level 4

- A. 1 and 2
B. 1 and 3
C. 2 and 3
D. 1, 2 and 3

8. Which of the following experiment will its reaction mixture give the highest temperature raise?

Level 5**

Experiment	HCl(aq)	NaOH(aq)
1	25 cm ³ of 1.0 mol dm ⁻³	25 cm ³ of 1.0 mol dm ⁻³
2	25 cm ³ of 2.0 mol dm ⁻³	25 cm ³ of 2.0 mol dm ⁻³
3	50 cm ³ of 2.0 mol dm ⁻³	50 cm ³ of 2.0 mol dm ⁻³
4	25 cm ³ of 3.0 mol dm ⁻³	25 cm ³ of 3.0 mol dm ⁻³

- A. 1
B. 2
C. 3
D. 4

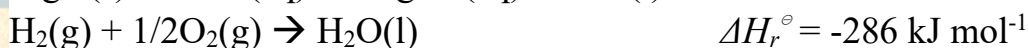
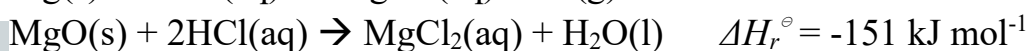
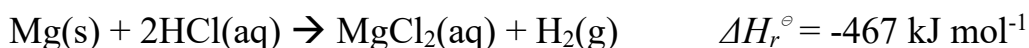
9. Consider the following two statements:

1st statement	2nd statement
The temperature rise of reaction mixture by reacting 50.0 cm ³ of 1.0 mol dm ⁻³ HCl(aq) with 50.0 cm ³ of 1.0 mol dm ⁻³ NaOH is higher than reacting 25.0 cm ³ of 1.0 mol dm ⁻³ HCl(aq) with 25.0 cm ³ of 1.0 mol dm ⁻³ NaOH.	The number of moles of water formed from reacting 50.0 cm ³ of 1.0 mol dm ⁻³ HCl(aq) with 50.0 cm ³ of 1.0 mol dm ⁻³ NaOH is more than reacting 25.0 cm ³ of 1.0 mol dm ⁻³ HCl(aq) with 25.0 cm ³ of 1.0 mol dm ⁻³ NaOH.

Level 5

- A. Both statements are true and the 2nd statement is a correct explanation of the 1st statement.
B. Both statements are true but the 2nd statement is NOT a correct explanation of the 1st statement.
C. The 1st statement is false but the 2nd statement is true.
D. Both statements are false.

10. Given the standard enthalpy change for the following reactions, calculate the standard enthalpy change for formation of magnesium oxide.



Level 5

A. +316 kJ mol⁻¹

B. -316 kJ mol⁻¹

C. +602 kJ mol⁻¹

D. -602 kJ mol⁻¹

🔥 想知道你嘅程度去到邊？ 🔥

✅ 用Google Form 交答案

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