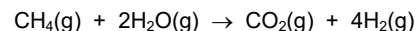


3 What contains 9.03×10^{23} oxygen atoms?

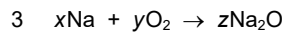
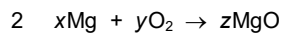
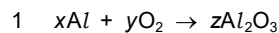
- A** 0.25 mol aluminium oxide
B 0.75 mol sulfur dioxide
C 1.5 mol sulfur trioxide
D 3.0 mol water

4 Methane and steam react to produce hydrogen.

0.80 g of methane and 1.35 g of steam react. One of the reactants is used up.

Which volume of hydrogen, measured at room conditions, will be produced?

- A** 1.80 dm³ **B** 3.60 dm³ **C** 4.80 dm³ **D** 7.20 dm³

17 Three equations are listed. x , y and z are all whole numbers.Which equations can be balanced if $x = 4$ and $z = 2$?

- A** 1 and 3 **B** 1 only **C** 2 only **D** 3 only

40 A sample of magnesium contains the isotopes ^{24}Mg , ^{25}Mg and ^{26}Mg only.The percentage abundance of ^{25}Mg and ^{26}Mg is the same.

The relative atomic mass of magnesium in the sample is 24.3.

What is the percentage abundance of ^{24}Mg ?

- A** 10% **B** 20% **C** 60% **D** 80%

Important values, constants and standards

molar gas constant	$R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$
Faraday constant	$F = 9.65 \times 10^4 \text{ C mol}^{-1}$
Avogadro constant	$L = 6.02 \times 10^{23} \text{ mol}^{-1}$
electronic charge	$e = -1.60 \times 10^{-19} \text{ C}$
molar volume of gas	$V_m = 22.4 \text{ dm}^3 \text{ mol}^{-1}$ at s.t.p. (101 kPa and 273 K) $V_m = 24.0 \text{ dm}^3 \text{ mol}^{-1}$ at room conditions
ionic product of water	$K_w = 1.00 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-6}$ (at 298 K (25 °C))
specific heat capacity of water	$c = 4.18 \text{ kJ kg}^{-1} \text{ K}^{-1}$ (4.18 J g ⁻¹ K ⁻¹)

The Periodic Table of Elements

Group																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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3 Li lithium 6.9	4 Be beryllium 9.0	atomic number atomic symbol name relative atomic mass														9 F fluorine 19.0	10 Ne neon 20.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
11 Na sodium 23.0	12 Mg magnesium 24.3	13 Al aluminum 27.0	14 Si silicon 28.1	15 P phosphorus 31.0	16 S sulfur 32.1	17 Cl chlorine 35.5	18 Ar argon 39.9	19 K potassium 39.1	20 Ca calcium 40.1	21 Sc scandium 45.0	22 Ti titanium 47.9	23 V vanadium 50.9	24 Cr chromium 52.0	25 Mn manganese 54.9	26 Fe iron 55.8	27 Co cobalt 58.9	28 Ni nickel 58.7	29 Cu copper 63.5	30 Zn zinc 65.4	31 Ga gallium 69.7	32 Ge germanium 72.6	33 As arsenic 74.9	34 Se selenium 79.0	35 Br bromine 79.9	36 Kr krypton 83.8	37 Rb rubidium 85.5	38 Sr strontium 87.6	39 Y yttrium 88.9	40 Zr zirconium 91.2	41 Nb niobium 92.9	42 Mo molybdenum 95.9	43 Tc technetium —	44 Ru ruthenium 101.1	45 Rh rhodium 102.9	46 Pd palladium 106.4	47 Ag silver 107.9	48 Cd cadmium 112.4	49 In indium 114.8	50 Sn tin 118.7	51 Sb antimony 121.8	52 Te tellurium 127.6	53 I iodine 126.9	54 Xe xenon 131.3	55 Cs cesium 132.9	56 Ba barium 137.3	57 La lanthanoids —	58 Ce cerium 140.1	59 Pr praseodymium 140.9	60 Nd neodymium 144.2	61 Pm promethium —	62 Sm samarium 150.4	63 Eu europium 151.9	64 Gd gadolinium 157.3	65 Tb terbium 158.9	66 Dy dysprosium 162.5	67 Ho holmium 164.9	68 Er erbium 167.3	69 Tm thulium 168.9	70 Yb ytterbium 173.0	71 Lu lutetium 175.0	72 Hf hafnium 178.5	73 Ta tantalum 180.9	74 W tungsten 183.8	75 Re rhenium 186.2	76 Os osmium 190.2	77 Ir iridium 192.2	78 Pt platinum 195.1	79 Au gold 197.0	80 Hg mercury 200.6	81 Tl thallium 204.4	82 Pb lead 207.2	83 Bi bismuth 209.0	84 Po polonium —	85 At astatine —	86 Rn radon —	87 Fr francium —	88 Ra radium —	89-103 actinoids —	104 Rf rutherfordium —	105 Db dubnium —	106 Sg seaborgium —	107 Bh bohrium —	108 Hs hassium —	109 Mt meitnerium —	110 Ds darmstadtium —	111 Rg roentgenium —	112 Cn copernicium —	113 Nh nihonium —	114 Fl flerovium —	115 Mc moscovium —	116 Lv livermorium —	117 Ts tennessine —	118 Og oganesson —	119 Nh nihonium —	120 Ds darmstadtium —	121 Rg roentgenium —	122 Cn copernicium —	123 Nh nihonium —	124 Fl flerovium —	125 Mc moscovium —	126 Lv livermorium —	127 Ts 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darmstadtium —	531 Rg roentgenium —	532 Cn copernicium —	533 Nh nihonium —	534 Fl flerovium —	535 Mc moscovium —	536 Lv livermorium —	537 Ts tennessine —	538 Og oganesson —	539 Nh nihonium —	540 Ds darmstadtium —	541 Rg roentgenium —	542 Cn copernicium —	543 Nh nihonium —	544 Fl flerovium —	545 Mc moscovium —	546 Lv livermorium —	547 Ts tennessine —	548 Og oganesson —	549 Nh nihonium —	550 Ds darmstadtium —	551 Rg roentgenium —	552 Cn copernicium —	553 Nh nihonium —	554 Fl flerovium —	555 Mc moscovium —	556 Lv livermorium —	557 Ts tennessine —	558 Og oganesson —	559 Nh nihonium —	560 Ds darmstadtium —	561 Rg roentgenium —	562 Cn copernicium —	563 Nh nihonium —	564 Fl flerovium —	565 Mc moscovium —	566 Lv livermorium —	567 Ts tennessine —	568 Og oganesson —	569 Nh nihonium —	570 Ds darmstadtium —	571 Rg roentgenium —	572 Cn copernicium —	573 Nh nihonium —	574 Fl flerovium —	575 Mc moscovium —	576 Lv livermorium —	577 Ts tennessine —	578 Og oganesson —	579 Nh nihonium —	580 Ds 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