



Essential Pre-Uni Chemistry K3.2

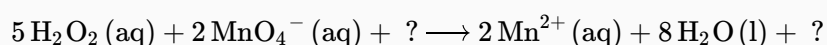
A Level



Complete the balanced equations to show the reactions between the following pairs of substances in acidic aqueous conditions (no fractions).

Part A Manganate(VII) and hydrogen peroxide

Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

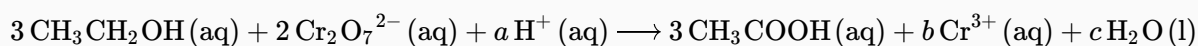


Part B Scandium and ethanoic acid

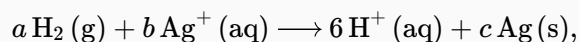
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.



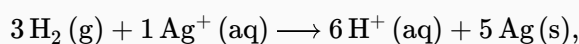
Part C Ethanol and boiling dichromate(VI)



This chemical equation is too long to fit on your screen, so please balance the equation and give your answer as a string of numbers in the order of *abc*. For example, if the question is

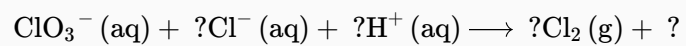


and you think the answer is



then input 315.

Please **click on and drag** the pre-loaded species to create a balanced chemical equation.





Oxidation of thiosulfate

A Level



An aqueous solution contains 1 mol of $\text{S}_2\text{O}_3^{2-}$ ions and this reduces 4 mol of Cl_2 molecules to Cl^- ions. What is the sulfur-containing product of this reaction?

- ☐ SO_2
- ☐ S
- ☐ SO_3^{2-}
- ☐ $\text{S}_4\text{O}_6^{2-}$
- ☐ SO_4^{2-}

Adapted with permission from UCLES, A-Level Chemistry, June 1989, Paper 3, Question 20

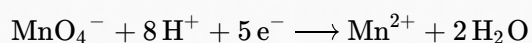
Iron in a nail

A Level



A nail of mass 1.40 g was dissolved in an excess of dilute sulfuric acid to form 100 cm³ of solution. A 10 cm³ sample of this solution required 4.0×10^{-4} mol of manganate (VII) for complete oxidation.

In acidic solution:



By assuming that, in dissolving in sulfuric acid, the iron in the nail was converted entirely into Fe²⁺ (aq) and that manganate (VII) oxidises Fe²⁺ to Fe³⁺, calculate:

Part A Moles of Fe²⁺



The number of moles of Fe²⁺ produced from the nail.

Part B % of Fe



The percentage of iron in the nail.

Adapted with permission from UCLES, A-Level Chemistry, June 1992, Paper 3, Question 2



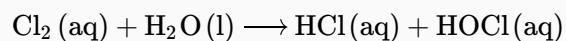
Essential Pre-Uni Chemistry K4.1

A Level



By assigning oxidation states to the relevant element in the following equations, show that disproportionation is occurring.

Part A (a)



State the element that is disproportionated in the reaction.

State the element's oxidation state when it first appears in the chemical equation.

State the element's oxidation state the second time it appears in the chemical equation.

State the element's oxidation state the third time it appears in the chemical equation.

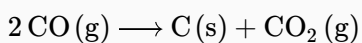
Part B (b)

State the element that is disproportionated in the reaction.

State the element's oxidation state when it first appears in the chemical equation.

State the element's oxidation state the second time it appears in the chemical equation.

State the element's oxidation state the third time it appears in the chemical equation.

Part C (c)

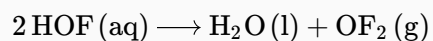
State the element that is disproportionated in the reaction.

State the element's oxidation state when it first appears in the chemical equation.

State the element's oxidation state the second time it appears in the chemical equation.

State the element's oxidation state the third time it appears in the chemical equation.

Part D (d)



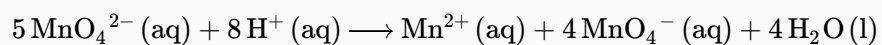
State the element that is disproportionated in the reaction.

State the element's oxidation state when it first appears in the chemical equation.

State the element's oxidation state the second time it appears in the chemical equation.

State the element's oxidation state the third time it appears in the chemical equation.

Part E (e)



State the element that is disproportionated in the reaction.

State the element's oxidation state when it first appears in the chemical equation.

State the element's oxidation state the second time it appears in the chemical equation.

State the element's oxidation state the third time it appears in the chemical equation.



Sodium nitrite

A Level



Nitrogen can be obtained in the laboratory by warming a mixture of ammonium chloride and sodium nitrite, NaNO_2 . Water is also produced and a solid is left.

Part A Ammonium chloride and sodium nitrite



Suggest an identity for the solid.

Part B Equation



Write a balanced equation for the reaction, including state symbols, balancing to obtain the lowest integer coefficients possible.

Part C Ammonium chloride and sodium nitrate



A similar reaction takes place when ammonium chloride is heated with sodium nitrate NaNO_3 but this time the only different product is an oxide of nitrogen. Suggest a formula for this oxide, and the oxidation state of nitrogen in it.

Formula:

Oxidation state:

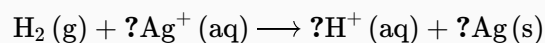


Essential Pre-Uni Chemistry K3.1



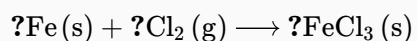
Balance the following redox equations:

Part A (a)



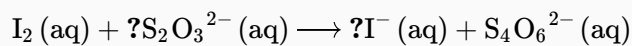
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part B (b)



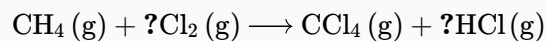
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part C (c)



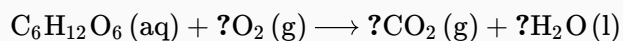
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part D (d)



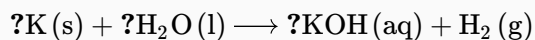
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part E (e)



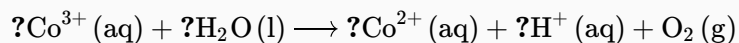
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part F (f)



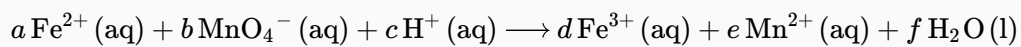
Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

Part G (g)

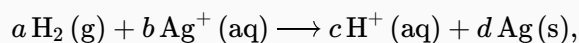


Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

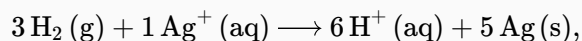
Part H (h)



This chemical equation is too long to fit on your screen, so please balance the equation and give your answer as a string of numbers in the order of *abcdef*. For example, if the question is

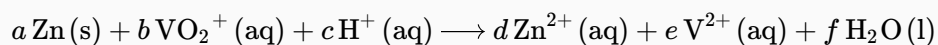


and you think the answer is

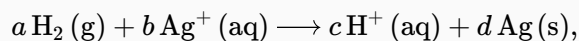


then input 3165.

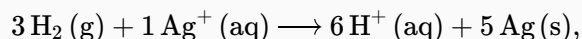
Part I (i)



This chemical equation is too long to fit on your screen, so please balance the equation and give your answer as a string of numbers in the order of *abcdef*. For example, if the question is

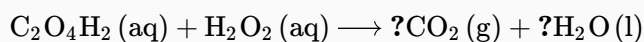


and you think the answer is



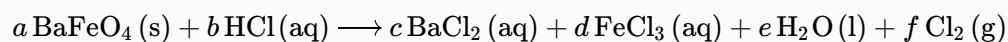
then input 3165.

Part J (j)

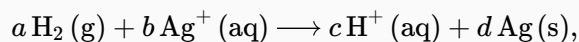


Please **click on and drag** the pre-loaded species to create a balanced chemical equation.

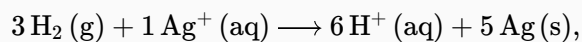
Part K (k)



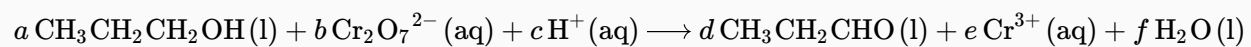
This chemical equation is too long to fit on your screen, so please balance the equation and give your answer as a string of numbers in the order of *abcdef*. For example, if the question is



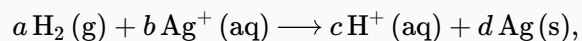
and you think the answer is



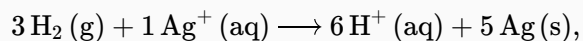
then input 3165.



This chemical equation is too long to fit on your screen, so please balance the equation and give your answer as a string of numbers in the order of *abcdef*. For example, if the question is



and you think the answer is



then input 3165.



Essential Pre-Uni Chemistry K3.3

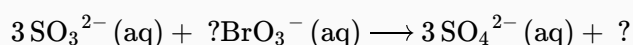
A Level



Complete the balanced equations to show the reactions between the following pairs of substances in alkaline aqueous conditions (no fractions).

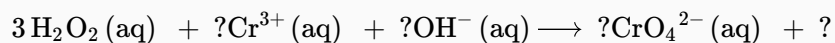
Part A Sulfite and bromate(V)

sulfite and bromate(V)



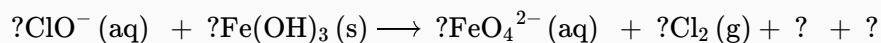
Part B Hydrogen peroxide and chromium(III)

hydrogen peroxide and chromium(III)



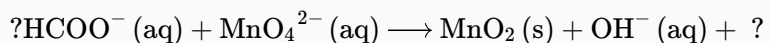
Part C Chlorate(I) and iron(III)

chlorate(I) and iron(III)



Part D Manganate(VI) and methanoate

manganate(VI) and methanoate



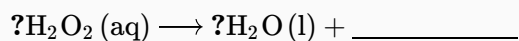


Essential Pre-Uni Chemistry K4.2



Complete and balance the following equations that represent disproportionation reactions.

Part A (a)

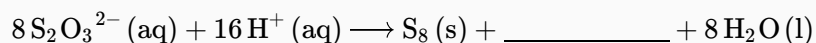


Part B (b)



Please **click on and drag** the pre-loaded species in the equation editor to create your chemical equation.

Part C (c)



Please **click on and drag** the pre-loaded species in the equation editor to create your chemical equation.



Physics. *You work it out.*

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