OCR (B) Chemistry A-Level

EL4 - Inorganic Chemistry and the Periodic Table

Flashcards

What is first ionisation enthalpy?

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The enthalpy change that occurs when one mole of electrons is removed from one mole of gaseous atoms.

What does the group (column) number represent in the periodic table?

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The group number represents the number of electrons present in the outer shell of the atom.

What does the period (row number) represent in the periodic table?

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The period represents the number of electron shells in the atom.

Why does first ionisation increase as we move across a period?

Why does first ionisation energy increase as we move across a period?

The number of protons in the nucleus increases which increases the nuclear charge and thus the nuclear force felt by outer electrons it therefore takes more energy to remove them.

What is the formula of a nitrate ion?

What is the formula of a nitrate ion?

NO_3^-

What is the formula of a sulfate ion?

What is the formula of a sulfate ion?

SO_4^{2-}

What is the formula of a carbonate ion?

What is the formula of a carbonate ion?

CO_3^{2-}

What is the formula of a hydroxide ion?

What is the formula of a hydroxide ion?

OH^-

What is the formula of an ammonium ion?

What is the formula of an ammonium ion?

NH_4^+

What is the formula of a hydrogencarbonate ion?

What is the formula of a hydrogencarbonate ion?

HCO_3^-

What is the formula of a copper ion?

What is the formula of a copper ion?

Cu^{2+}

What is the formula of a zinc ion?

What is the formula of a zinc ion?

Zn^{2+}

What is the formula of a lead ion?

What is the formula of a lead ion?

Pb^{2+}

What is the formula of a Iron(II) ion?

What is the formula of a Iron(II) ion?

Fe^{2+}

What is the formula of a Iron(III) ion?

What is the formula of a Iron(III) ion?

Fe^{3+}

Why does first ionisation energy decrease down a group?

Why does first ionisation energy decrease down a group?

The number of shells in the atom decreases, which increases the shielding of outer electrons from the nucleus. The nuclear radius also increases. Both of these factors mean that the attractive nuclear force felt by the electron is smaller, so it takes less energy to remove outer electrons.

How do the charge densities of group 2 ions affect the thermal stability of their carbonates?

How do the charge densities of group 2 ions affect the thermal stability of their carbonates?

Smaller ions with the same charge have higher charge densities and distort the carbonate ion, so that the compound will decompose at a lower temperature.

How can we test for Fe^{2+} ions?

How can we test for Fe^{2+} ions?

Add OH^- ions, the green solution will form a green precipitate.

How can we test for Fe^{3+} ions?

How can we test for Fe^{3+} ions?

Add OH^- ions, the yellow solution will form an orange precipitate.

How can we test for Cu^{2+} ions?

How can we test for Cu^{2+} ions?

Add OH^- ions, the blue solution will form a blue precipitate.

How can we test for NH_4^+ ions?

How can we test for NH_4^+ ions?

Add $NaOH_{(aq)}$ to a boiling tube containing the NH_4^+ ions, warm the boiling tube. Any vapours given off by the tube will turn damp red litmus paper blue if NH_4^+ ions are present.

How can we test for Al^{3+} ions?

How can we test for Al^{3+} ions?

Add OH^- ions, the colourless solution will form a white precipitate.

How can we test for Cl^- ions?

How can we test for Cl^- ions?

Add a few drops of HNO_3, shake the test tube. Add a few drops of $AgNO_3$, a white precipitate should form.

WHITE PRECIPITATE

How can we test for Br^- ions?

How can we test for Br^- ions?

Add a few drops of HNO_3, shake the test tube. Add a few drops of $AgNO_3$, a cream precipitate should form.

CREAM PRECIPITATE

How can we test for I^- ions?

How can we test for I^- ions?

Add a few drops of HNO_3, shake the test tube. Add a few drops of $AgNO_3$, a yellow precipitate should form.

YELLOW PRECIPITATE

How can we test for SO_4^{2-} ions?

How can we test for SO_4^{2-} ions?

Add Ba^{2+} ions, a white precipitate should form.

How can we test for CO_3^{2-} ions?

How can we test for CO_3^{2-} ions?

Add dilute nitric acid, if effervescence occurs then CO_3^{2-} ions are present.

How can we test for Li^+, Na^+, K^+ and Ca^+ ions?

How can we test for Li^+, Na^+, K^+ and Ca^+ ions?

Evaporate the water from the sample, moisten a test wire and collect the solid residue from the evaporating dish. Pass this residue into a bunsen burner and record the colour of the flame.

Which ions show which colours in the flame test?

Which ions show which colours in the flame test?

Ion	Flame colour
Na^+	Orange
Ca^+	Brick red
Li^+	Red
K^+	Lilac
Ba^{2+}	Green
Cu^{2+}	Blue-Green

How can we test for Pb^{2+} ions?

How can we test for Pb^{2+} ions?

Add OH^- ions, a white precipitate will form. Upon adding excess OH^- ions, the precipitate will dissolve.