INKCHEMISTRY FLASHCARDS

Group 2 and Group 7

Unit C13 · 39 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions to learn and misconceptions to correct. These cards, and a check-yourself question for every lesson, run on the website with spaced-repetition scheduling, at inklearning.co.uk/chemistry/flashcards.

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DEFINITION

Define: Oxidation.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Reducing agent.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: First ionisation energy.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Second ionisation energy.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Shielding.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Atomic radius.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Metallic bonding.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Basic oxide.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

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DEFINITION

A species that donates electrons to another species, and is itself oxidised in doing so.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The loss of electrons by a species, which raises its oxidation state.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The energy required to remove one electron from each ion in one mole of gaseous 1+ ions to form one mole of gaseous 2+ ions.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The energy required to remove one electron from each atom in one mole of gaseous atoms to form one mole of gaseous 1+ ions.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Half the distance between the nuclei of two bonded atoms of the same element.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The repulsion of an outer electron by the electrons in inner shells, which reduces the attraction of the nucleus it feels.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

A metal oxide that reacts with an acid to form a salt and water.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The electrostatic attraction between a lattice of positive metal ions and a sea of delocalised electrons.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

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DEFINITION

Define: Batch process.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Redox reaction.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

SPOT THE ERROR

Say what is wrong with this claim:

Going down Group 2 the nucleus gets more protons, so it holds the outer electrons more tightly and the metals get less reactive.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Define: Sparingly soluble.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Precipitate.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Flue-gas desulfurisation.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Neutralisation.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Spectator ion.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

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DEFINITION

A reaction in which one species is oxidised and another is reduced, electrons being transferred from one to the other.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

A process in which a fixed quantity of material is converted in one run, the reactor being emptied and refilled between runs.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

Dissolving only to a very small extent, so that most of the solid remains undissolved, as magnesium hydroxide does in water.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

SPOT THE ERROR

The extra protons are outweighed. Each step down adds a shell, so the outer electrons are further from the nucleus and more shielded, and the first ionisation energy falls, from 900 kJ mol^{-1} for beryllium to 503 kJ mol^{-1} for barium. Electrons lost more easily make the metal more reactive.

GROUP 2: TRENDS DOWN THE GROUP AND REACTIONS WITH WATER

DEFINITION

The removal of sulfur dioxide from the waste gases of a power station by reaction with a base such as calcium oxide or calcium carbonate.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

An insoluble solid formed when two solutions are mixed and ions in them combine.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

An ion present in the reaction mixture that is unchanged by the reaction and is left out of the ionic equation.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

The reaction of an acid with a base, in which hydrogen ions react with hydroxide ions to form water.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

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DEFINITION

Define: Ionic equation.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Flame test.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Thermal decomposition.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Polarising power.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

SPOT THE ERROR

Say what is wrong with this claim:

Everything gets more soluble as you go down a group, so barium sulfate must dissolve better than magnesium sulfate.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Define: Van der Waals forces.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Electronegativity.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Oxidising agent.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

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DEFINITION

A test in which a compound is heated in a flame and the colour of the light emitted identifies the metal ion present.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

An equation showing only the ions and other species that take part in a reaction, with spectator ions omitted.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

The ability of a cation to distort the electron cloud of a neighbouring anion; it increases with the charge of the cation and decreases with its size.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

The breaking down of a compound into simpler substances by heating.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

Attractions between molecules caused by temporary dipoles inducing dipoles in neighbouring molecules; also called induced dipole–dipole forces.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

SPOT THE ERROR

The trend depends on the anion. Group 2 hydroxides become more soluble down the group, from sparingly soluble $Mg(OH)_2$ to $Ba(OH)_2$; the sulfates become less soluble, from $MgSO_4$, which dissolves freely, to $BaSO_4$, which is insoluble enough to be swallowed as a barium meal and to be the precipitate in the sulfate test.

GROUP 2 COMPOUNDS: SOLUBILITY, USES AND THE SULFATE TEST

DEFINITION

A species that accepts electrons from another species, and is itself reduced in doing so.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

The power of an atom to attract the pair of electrons in a covalent bond.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

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DEFINITION

Define: Reduction.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Displacement reaction.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Half-equation.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Bond enthalpy.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Thermal stability.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

SPOT THE ERROR

Say what is wrong with this claim:

Iodine is the most reactive halogen because it is the biggest atom and has the most electrons.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Define: Reducing ability.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID ...

DEFINITION

Define: Gravimetric analysis.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID ...

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DEFINITION

A reaction in which a more reactive element takes the place of a less reactive one in a compound or in solution.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

The gain of electrons by a species, which lowers its oxidation state.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

The enthalpy change when one mole of a given covalent bond is broken, with all species in the gaseous state.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

An equation for either the oxidation or the reduction part of a redox reaction, showing the electrons lost or gained.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

SPOT THE ERROR

A halogen reacts by gaining an electron, and the biggest atom gains one least readily: iodine's outer shell is furthest from the nucleus and most shielded. Fluorine is the most reactive halogen and the strongest oxidising agent. Chlorine displaces bromine and iodine from their salts; iodine displaces neither.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

The resistance of a compound to decomposition when it is heated.

GROUP 7: TRENDS DOWN THE GROUP AND DISPLACEMENT REACTIONS

DEFINITION

Finding the amount of a substance by converting it into a precipitate of known formula, which is filtered, dried and weighed.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID ...

DEFINITION

How readily a species donates electrons; for the halide ions it increases from F^- to I^-.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID ...

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DEFINITION

Define: Acidified silver nitrate.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Define: Complex ion.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Define: Disproportionation.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Define: Sodium chlorate(I).

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Define: Hydrogen halide.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Define: Strong acid.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

SPOT THE ERROR

Say what is wrong with this claim:

Concentrated sulfuric acid does the same thing to every sodium halide: it just makes the hydrogen halide gas.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

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DEFINITION

A central metal ion bonded to one or more ligands by coordinate bonds, as in $[Ag(NH_3)_2]^+$.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

Silver nitrate solution to which dilute nitric acid has been added, used to test for halide ions.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

NaClO, the bleaching and disinfecting compound formed when chlorine reacts with cold dilute sodium hydroxide.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

A reaction in which the same element is simultaneously oxidised and reduced.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

An acid that is completely dissociated into ions in aqueous solution.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

DEFINITION

A compound of hydrogen and a halogen, HX, which forms misty white fumes in moist air.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

SPOT THE ERROR

Only chloride stops at the hydrogen halide. Bromide reduces the acid as well, giving brown bromine and sulfur dioxide; iodide goes further, giving purple iodine, yellow sulfur and hydrogen sulfide. The larger the halide ion, the more easily it gives up electrons, so the stronger a reducing agent it is.

HALIDE IONS, THE SILVER NITRATE TEST, CONCENTRATED SULFURIC ACID …

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