INKCHEMISTRY FLASHCARDS

Periodicity and Period 3

Unit C12 · 35 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: Periodicity.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: S-block element.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: P-block element.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: D-block element.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Atomic radius.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Shielding.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: First ionisation energy.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Metallic bonding.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

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DEFINITION

An element whose last electron, in filling order, enters an s subshell, as in groups 1 and 2.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

A repeating pattern of physical or chemical properties across the periods of the periodic table.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

An element whose last electron, in filling order, enters a d subshell, as from scandium to zinc.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

An element whose last electron, in filling order, enters a p subshell, as in groups 3 to 0.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

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

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

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

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

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

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

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.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

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DEFINITION

Define: Giant covalent structure.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Van der Waals forces.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Ionic radius.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Isoelectronic.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

SPOT THE ERROR

Say what is wrong with this claim:

Melting point goes up across a period because the atoms keep getting heavier.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Define: Alkali.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Oxidation.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Reduction.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

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DEFINITION

Weak attractions between molecules caused by temporary dipoles, which induce dipoles in neighbouring molecules.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

A lattice in which every atom is joined to its neighbours by covalent bonds extending throughout the whole structure.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

Describes atoms or ions that have the same number of electrons in the same electron configuration.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

The radius of an ion in an ionic lattice, found from the distance between the nuclei of neighbouring ions.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

A base that dissolves in water to release hydroxide ions, $OH^-(aq)$.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

SPOT THE ERROR

Melting point is set by structure and bonding, not mass. Across Period 3 it rises from sodium to aluminium as metallic bonding strengthens, peaks at macromolecular silicon, then collapses at phosphorus, sulfur, chlorine and argon, which are simple molecular. Argon is heavier than silicon and melts 1600 °C lower.

PERIODICITY: TRENDS ACROSS PERIOD 3 AND THE BLOCKS OF THE TABLE

DEFINITION

The gain of electrons by a species, or a decrease in its oxidation state.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

The loss of electrons by a species, or an increase in its oxidation state.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

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DEFINITION

Define: Oxide.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Oxidation state.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Empirical formula.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Molecular formula.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Sublimation.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Dimer.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

Define: Dative covalent bond.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

SPOT THE ERROR

Say what is wrong with this claim:

Magnesium doesn't react with water at all; it just sits at the bottom of the beaker.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

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DEFINITION

The charge an atom would have if all its bonds were ionic; the oxidation states in a neutral compound add up to zero.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

A compound containing oxygen and one other element only.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

The actual number of atoms of each element in one molecule of a compound.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

The simplest whole-number ratio of atoms of each element in a compound.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

A molecule formed when two identical molecules join, as two $AlCl_3$ molecules join to form Al_2Cl_6.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

The change of state of a substance directly from solid to gas, without melting.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

SPOT THE ERROR

Magnesium reacts with cold water, very slowly: over several days a clean ribbon gives a few bubbles of hydrogen and a faintly alkaline solution of magnesium hydroxide. With steam it burns brightly in seconds: $Mg(s) + H_2O(g) \rightarrow MgO(s) + H_2(g)$. Sodium does in seconds with cold water what magnesium takes days to do.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

DEFINITION

A covalent bond in which both electrons of the shared pair come from the same atom.

THE PERIOD 3 ELEMENTS: REACTIONS WITH OXYGEN AND WATER

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DEFINITION

Define: Ionic bonding.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Covalent character.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Basic oxide.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Acidic oxide.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Oxoacid.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Weak acid.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Amphoteric.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Neutralisation.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

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DEFINITION

Partial sharing of electrons in an ionic compound, caused by a small, highly charged cation distorting the electron cloud of the anion.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

The electrostatic attraction between oppositely charged ions in a lattice.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

An oxide that reacts with bases to form a salt and water; in Period 3, a covalent oxide.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

An oxide that reacts with acids to form a salt and water; in Period 3, an ionic oxide containing O^{2-} ions.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

An acid that only partially dissociates into ions in aqueous solution, as H_2SO_3 does.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

An acid in which the acidic hydrogen atoms are bonded to oxygen atoms, as in H_2SO_4 and H_3PO_4.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

The reaction of an acid with a base to form a salt and water.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Describes a substance that can react both as an acid and as a base.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

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DEFINITION

Define: Electronegativity.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

Define: Hydrolysis.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

SPOT THE ERROR

Say what is wrong with this claim:

Every oxide reacts with acids, because an oxide is a base.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

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DEFINITION

A reaction in which a bond in a compound is broken by reaction with water.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

DEFINITION

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

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

SPOT THE ERROR

Only metal oxides are bases. Across Period 3 the oxides run from basic Na_2O and MgO, through amphoteric Al_2O_3, which reacts with acids and with alkalis, to acidic SiO_2, P_4O_{10} and SO_2, which react with alkalis and not with acids. The bonding changes from ionic to covalent, and the acid–base character changes with it.

THE PERIOD 3 OXIDES: STRUCTURE, BONDING AND ACID–BASE CHARACTER

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