



Materials Science and Engineering

TOPIC 1: INTRODUCTION. FAMILIES OF MATERIALS APPLICATIONS AND SELECTION CRITERIA. BONDING IN SOLIDS.

Evaluation Test

Important: Mark the right answer with a X. The correct answers will mark + 1 points while the incorrect answers will mark as -0.33 points. Non answered questions will not mark nor positively nor negatively. The resulting mark will not be smaller than 0 in any case. There is only one correct answer per question. Good luck!

In materials with ionic bonding:	
	When the ion size increases, the lattice energy increases.
	The melting temperature usually decreases when the valance of ions increases
	When the lattice energy is high, usually the melting point is high.
	When the electronegativity difference of the ions is low, the percentage of covalent character of the bond is low.

A material with a high bonding energy between atoms is expected to have:	
	High melting point
	High coefficient of thermal expansion
	Low stiffness
	Good electrical conductivity

The strength of atomic or molecular bonds in solids:	
	Is higher for materials with metallic bonding than for materials with ionic bonding.
	Is usually higher in materials with high melting point.
	It decreases with increasing lattice energy.
	Is lower for directional bonds.

In polymeric materials:	
	Bonding between the atoms of molecules within the chains is primarily due to non-directional covalent bonds
	Bonding in-between the chains is due to covalent bonds
	Bonding between the atoms of molecules within the chains is particularly directional with a fixed angle between the bonds
	Bonding between the atoms of molecules within the chains is primarily due van der waals bonds

In materials with metallic bonding:	
	Electrical charge is transferred by the movement of entire atoms
	Atoms move past one another with relative ease when a force is applied, causing deformation
	Electrons are bonded by secondary Van der Waals bonds
	Bonding is particularly directional