Guiding Question revisited

What role do bonding and structure have in the design of materials?

In this chapter we used models of bonding to describe and explain the properties of some important materials.

- [ ] Bonding in materials is best described as a continuum rather than as discrete types, and can be represented as a triangle of bonding.
- [ ] The position of an element or compound in the bonding triangle is determined from electronegativity values.
- [ ] From the position of a substance in the bonding triangle, we can deduce its bonding and predict its properties.
- [ ] Alloys are homogeneous mixtures of metals with enhanced properties.
- [ ] Metals are able to form alloys because of the non-directional nature of metallic bonding.
- [ ] Polymers are macromolecules composed of subunits called monomers held together by covalent bonds.
- [ ] Addition polymers form from monomers that possess a double bond which can break to create new bonding positions for the attachment of neighbouring monomers.
- [ ] Addition polymerization reactions do not yield a by-product.
- [ ] Plastics are polymers with properties that give them widespread uses in almost all aspects of society.
- [ ] The distinct properties of plastics also cause them to accumulate in the environment without being broken down.
- [ ] Use of biodegradable plastics and recycling programmes are important steps to improve the processing of plastic waste, but the urgent need is to reduce the global production of plastic.