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# OCR A GCSE Chemistry

## Topic 1: Particles

### The particle model

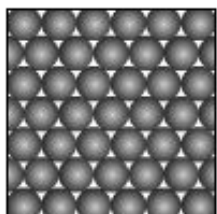
Notes



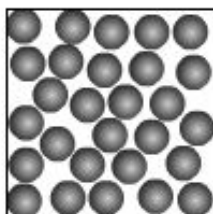


*C1.1a describe the main features of the particle model in terms of states of matter and change of state*

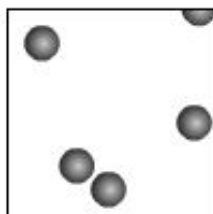
- The three states of matter are solid, liquid and gas
- Melting and freezing take place at the melting point
- Boiling and condensing take place at the boiling point



Solid



Liquid



Gas

- They can be represented by the simple model above, particles are represented by small solid spheres
- in a solid, the particles are close together and are regularly arranged
- in a liquid, the particles are close together but have a random arrangement
- in a gas, the particles are spread apart and have a random arrangement

*C1.1b explain in terms of the particle model the distinction between physical changes and chemical changes*

- Chemical changes – require a chemical reaction, and for there to be a change from reactants to products, i.e. what you produce is chemically different from what you react
- Physical changes – require energy, and involve changes in state but there are no change to the particles themselves
  - Melting, boiling, freezing, condensing are all examples of physical changes



*C1.1c (HT only) explain the limitations of the particle model in relation to changes of state when particles are represented by inelastic spheres (e.g. like bowling balls)*

- Limitations – does not take into account
  - The forces of attraction between particles
    - The amount of energy needed to change state from solid to liquid and from liquid to gas depends on the strength of the forces between the particles of the substance.
    - The stronger the forces between the particles the higher the melting point and boiling point of the substance.
  - The size of particles & the space between the particles
    - The nature of the particles involved depends on the type of bonding and the structure of the substance (e.g. spaces between particles)

