Composite material

Composite materials are formed by two or more components so that the properties of the final material are better than the properties of the components separately.

This kind of materials consist of:

- **Matrix**
- **Reinforcement**

Composite materials examples

- Plastics reinforced with glass fibre or other fibres.
- Metal matrix composite materials.
- Ceramic matrix composite materials
- Ceramic-metal composites.
- Concrete.
- Wood composites.

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nanomaterials

Nanoscale materials are defined as a set of substances where at least one dimension is less than approximately 100 nanometers. A nanometer is one millionth of a millimeter - approximately 100,000 times smaller than the diameter of a human hair. Nanomaterials are of interest because at this scale unique optical, magnetic, electrical, and other properties.

Characteristics of nanomaterials

Detailed assessments may include the following:

1. Physical properties:

· Their size, shape, specific surface area, and ratio of width and height

· Whether they stick together

· Size distribution

· How smooth or bumpy their surface

· Structure, including crystal structure and any crystal defects

· How well they dissolve

2. Chemical properties:

· Molecular structure.

· Composition, including purity, impurities or additives.

· Whether it is held in a solid, liquid or gas.

· Surface chemistry.

· Attraction to water molecules or oils and fats.

Classification.

* Classification is based on the number of dimensions, which are not confined to the nanoscale range (<100 nm).

* (1) zero-dimensional (0-D).

* (2) one-dimensional (1-D).

* (3) two-dimensional (2-D).

* (4) three-dimensional (3-D).