



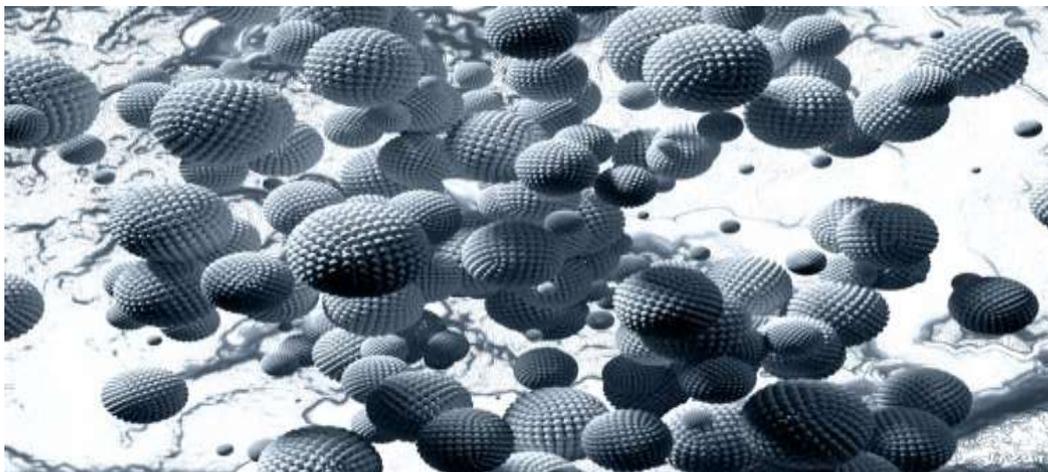
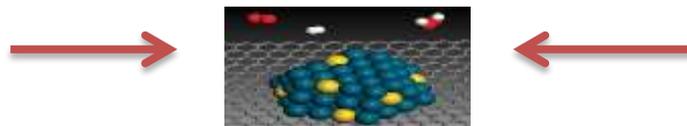
**AL-Mustaqbal University College**  
**Radiology Techniques Department**

**First Class**

**Practical General Chemistry**

**Second lecture (2)**

**Nanoparticle**



**Lecturer: M.Sc. Esraa Rafied Abass**

# Nanoparticle

A nanoparticle or ultrafine particle is usually defined as a particle of matter that is between 1 and 100 nanometres (nm) in diameter. The term is sometimes used for larger particles, up to 500 nm .

## Application of nanoparticle

The applications of nanotechnology are wide-ranging and fall into many industrial, medical, agricultural and other fields

### 1- medicine

**1.1 Diagnosis :**It uses nanoparticles and bound to an appropriate antibody to classify certain particles, particles, and microorganisms.

**1.2 Medication delivery:**Nanotechnology is one of the technologies that has caused prosperity and progress in the medical field, with the ability to

deliver drugs to specific cells using nanoparticles.

**1.3 Tissue Engineering:** Nanotechnology helps to reproduce and repair damaged tissue. Tissue engineering takes advantage of artificially stimulated cell proliferation by using growth factors on appropriate nanomaterial.

## 2- Chemistry and the environment

**2.1 Motivation:** Potential applications of nanoparticles in catalysis range from fuel cells to catalytic converters and photocatalytic devices. The importance of stimulation also appears in the production of chemicals.

**2.2 Filtration:** Photochemistry is expected to have a strong impact on both wastewater treatment and air purification processes as well as energy storage devices.

## 3-heavy industries

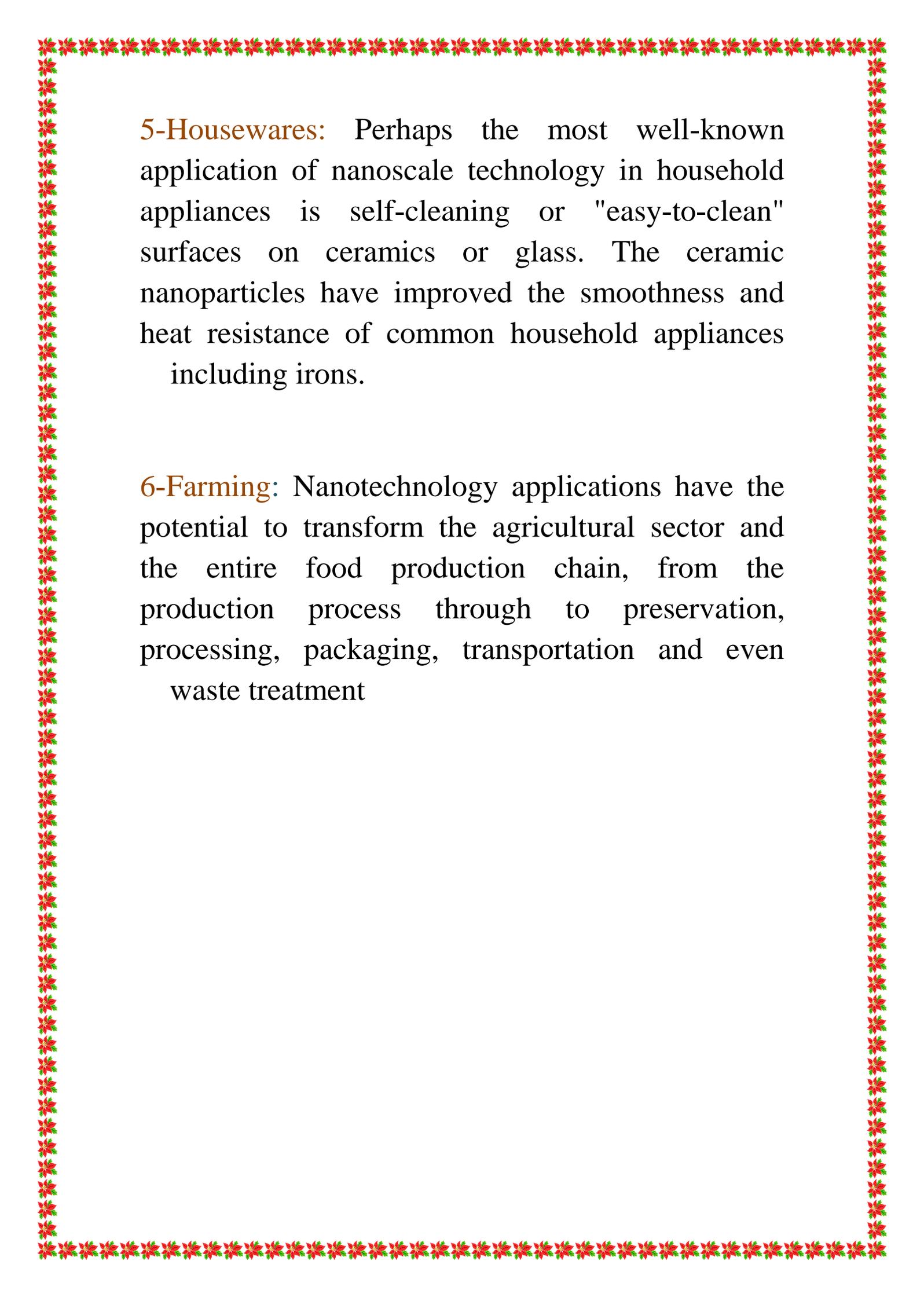
**3.1 space:**Lighter, stronger materials will be a huge benefit in aircraft manufacturing, increasing performance efficiency.

**3.2 Constructions:** Nanotechnology has the power to increase the rate of construction and make it a faster, cheaper and more versatile process. The automation process of nanotechnology may allow construction to create structures and buildings ranging from advanced homes to massive skyscrapers much faster and at a much lower cost.

**3.3 Strainers:**As a result of using nanotechnology applications, refineries producing materials, including steel and aluminum, will be able to remove and eliminate any impurities in the materials they produce .

**3.4 Manufacture of vehicles:** Just as in spacecraft manufacturing, lighter, stronger materials are a great asset in making vehicles and cars that are faster and safer. Combustion engines also benefit from parts that are rigid and heat-resistant.

**4-makeup:** One area of application of nanotechnology is in sunscreens. The traditional UV protection method suffers from its lack of long-term stability. However, sunscreens based on mineral nanoparticles, including titanium dioxide, provide more benefits.



**5-Housewares:** Perhaps the most well-known application of nanoscale technology in household appliances is self-cleaning or "easy-to-clean" surfaces on ceramics or glass. The ceramic nanoparticles have improved the smoothness and heat resistance of common household appliances including irons.

**6-Farming:** Nanotechnology applications have the potential to transform the agricultural sector and the entire food production chain, from the production process through to preservation, processing, packaging, transportation and even waste treatment