



## **Materials Science and Nanotechnology Center (MSNC)**

MSNC is the research center aims at the prosperity of the Egyptian economy through industries that develop and exploit the availability of natural raw materials, industrial and agricultural waste in order to improve the standard of living in Egypt.

### **MSNC objectives:**

1. Classifying the sources of natural resources in a systematic way in Egypt to provide a comprehensive characterizing of the properties, importance and quantities of these materials.
2. Forming a comprehensive research team for environmental disciplines and establishing research laboratories that serve these specialties to understand the properties and use of these materials.
3. Adopting research projects capable of optimal utilization of these resources to support the Egyptian economy.

4. Determining the extent of the added value of these materials through analysis of these projects and a feasibility study.

5. Providing a model for the international community by studying the full viability of the natural resources available in Egypt.

6. Preparing specialized teams in the field of nanotechnology by employing administrators from the chemistry and physics departments at the center able to introduce new methods for preparing important nanomaterials and their utilization in the fields of advanced industry and medicine.

7. Addressing novel methods for growing and characterizing low dimensional structures ranging from quantum wells to wires and dots, and its application of direct impact on our society.

8. Focusing on educational and training issues for graduate students to prepare a new generation of collaborative spirits for future extension of the center.

### **Instruments available in the center:-**

#### **1. Microwave**



It can be used for the rapid synthesis of nanomaterials and performing a chemical reactions in a short time.

#### **2. Solar Simulator**



It measures solar cell efficiency and it can be used as a source of sunlight for photo-catalytic reactions in the laboratory.

#### **3. High Energy Ball Milling Machine**



It can grind the particles to as small as 5 nm.

#### 4. High Speed Centrifuge



It separates particulates in suspension according to their density.

#### 5. Gas Chromatography



It is an analytical technique used to separate the chemical components of a sample mixture and then detect them to determine their presence or absence and/or how much is present.

#### 6. Spectrophotometer



It measures light intensity as a function of wavelength and are commonly used to measure the concentration of a compound in an aqueous solution.

#### 7. Spectrofluorometer



It is an instrument which takes advantage of fluorescent properties of some compounds in order to provide information regarding their concentration and chemical environment in a sample.

#### 8. VSM



It used to measure the magnetic properties of solids and liquids.

#### 10. Digital Viscometer



It is used to determine the viscosity of a fluid under specific flow and atmospheric conditions.

#### 11. Differential Scanning Calorimeter



It is used to measure the phase transition of the materials when they are heated.

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