

# Material Science

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### Chapter 3. Imperfections in Solids

#### **Highlights, Motivation and Critical Concepts:**

As a saying go by, *nature is not perfect*, not the solid materials either. Structures dealt in previous modules are subject to exceptions i.e. real crystal deviate from the perfect periodicity that was assumed in the previous module in a number of ways. Thus, all solids contain large number of imperfections or defects. The term imperfection or defect is generally used to describe any deviation from an orderly array of lattice points i.e. a region of disruption. Volume-wise, the disrupted regions may be just about 0.01% of total volume, the value which can be ignored safely in practical engineering. However, many of the engineering properties of solids are structure-sensitive. They vitally depend on the presence or absence of defects, however infrequent they may be when present. Thus there is need, and it is must for an engineer to understand the real behavior of solids and influence of defects over properties of solids under applied conditions.