

Introduction to band gap

What is band gap?

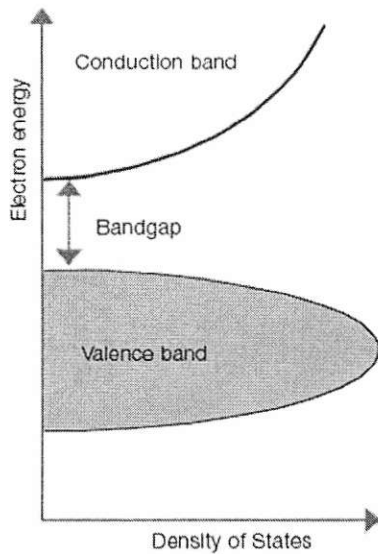


Figure 1. Explanation of bandgap

Band gap is very important because materials with different band have different utilities. (There will be several examples and detailed explanation—conductor, insulator, semiconductor. Also, semiconductor can be separated into several kinds. Some examples for several specific applications will be given.)

Band gap and structure.

Methods

Firstly, calculation of band gap will be given here.

Usually, there are two methods to measure band gap- optical method and electrical method.

For electrical methods, the well-known Shockley equation is $I = I_0(\exp(qV/kT) - 1)$

And an example of detailed band gap measurement will be given.

Figure 2 gives an example of h-BN thin film band gap measurement.

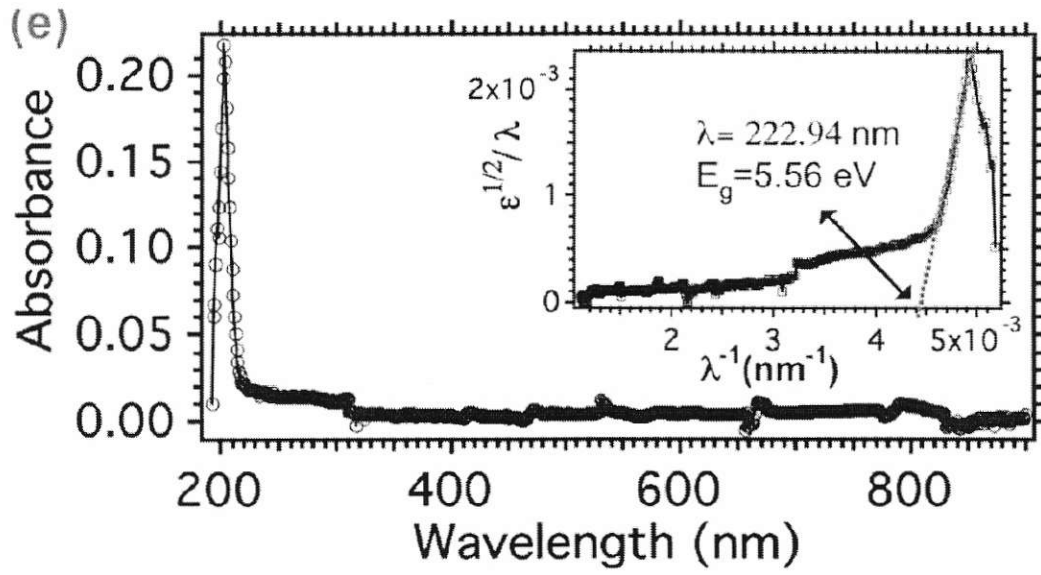


Figure 2. Optical method to measure BN film band gap

Advantages and disadvantages and ranges of applications