

UNIVERSITY OF EDUCATION TOWNSHIP LAHORE

PRESENTATION

TOPIC: VBT IN METALLIC BONDING

SUBJECT: CHEMISTRY

PROGRAM: BS CHEMISTRY

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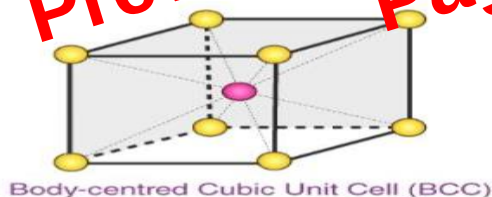
VBT IN METALLIC BONDING (RESONANCE THEORY)

There are basically three Theories which explain Metallic bonding in the Metals.

- FREE ELECTRONS THEORY / ELECTRON GAS THEORY / ELECTRON POOL THEORY
- VALENCE BOND THEORY (VBT)
- MOLECULAR ORBITAL THEORY (MOT)

Here we will discuss about only Valence Bond Theory (VBT). VBT was proposed by Linus Pauling to explain the metallic bonding in the metals. According to this theory Metallic bonding is treated as Covalent bond in the metals. By the X-rays analysis of lithium metal it is shown that Lithium is BBC (body centered cubic) structure. In this body centered cubic structure Lithium is in the center of a cube and is surrounded by the 8 Lithium atoms.

Electronic configurations of Lithium = $1s^2 2s^1$



A covalent bond contains 2 electrons and in the BBC structure there are 8 Covalent bonds. So we need 16 electrons. And in the BBC structure of Lithium metal there are only 9 electrons as 9 Lithium atoms are available for metallic bonding. This deficiency of electrons causes resonance of covalent bonds. Therefore covalent bonding in metals is delocalized and not localized. There are two types of resonance of covalent bonding that occurs in the lithium metals.

SYNCHRONIZED RESONANCE: