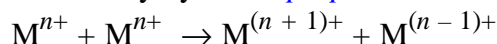


## Mott transition

A transition occurring only in ‘single-valent’ systems from strongly correlated ( $U > W$ ) to weakly correlated ( $U < W$ ) electrons as a result of a change of bandwidth  $W$ .  $W$  reflects the strength of the interatomic interactions in a periodic array of like atoms and  $U$  is a measure of the intra-atomic interactions, i.e. the electrostatic energy involved in the creation of polar states by transferring an electron from one atom to the next, as shown schematically by the *disproportionation* reaction:



A  $U > W$  produces a magnetic semiconductor; a  $U < W$  gives rise to a metal (normally nonmagnetic). Note also that  $U$  and  $W$  can be altered by changes in interatomic distances, brought about through temperature or pressure variations or by introducing an alloying element.

Synonymous with Mott–Hubbard transition.

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