# Ion-Association and Ion-Solvation Behaviour of Methy, Phenyl and Benzyl trimethyl ammonium bromide in DMSO-Water mixtures at 303K

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**ABSTRACT:**

A exhaustive study have been through of the ion-solvation and association of the Methyl trimethyl ammonium bromide (MTMAC), Phenyl trimethyl ammonium bromide (PTMAC) and Benzyl trimethyl ammonium bromide (BTMAC) in aqueous dimethyl sulphoxide (DMSO) at 303K using conductance data. The ionic contributions to the limiting equivalent conductances have been analyzed by Fuoss conductance-concentration equation equation. The $K_A$ values increased rapidly with increasing organic solvent composition and maximum at 60-100% v/v DMSO in water. This increase is due to the formation of the additional association species i.e. contact ion pair (CIP). Strong association due to closer contact among the ions was found for all these electrolytes in this solvent medium. The strong ion-solvent interactions absorbed irregular trend in relative ionic conductance is observed. Standard free energy changes are all negative and are in the range 2-10 $kJmol^{-1}$.

KEY WORDS**:** *Association constant, Contact ion pair, Limiting molar conductance, Free energy.*

## Conclusions:

In pure solvents ( water, DMSO) the KA values of the three electrolytes used are in the order BTMAC > MTMAC > PTMAC suggesting that, the ion-pair in benzyl salt is more stable than the other two salts.

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