

### Quantitative Estimation of Draw Solution in Forward Osmosis Process

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The need to alleviate water scarcity and ensure good quality drinking water has shifted the focus of scientists and engineers towards the forward osmosis desalination process. Advantages of this process include high feed water recovery, brine discharge minimization, relatively low energy requirement and cost as compared to the conventional reverse osmosis process. For effective FO desalination Ammonium Bicarbonate ( $\text{NH}_4\text{HCO}_3$ ) salt is used to form the draw solution. This salt is then separated from the desalinated water in the solute recovery system. As the inorganic salts breaks up into  $\text{NH}_4^+$  and  $\text{HCO}_3^-$  ions in water, these are further transformed into Ammonia ( $\text{NH}_3$ ) and Carbon dioxide ( $\text{CO}_2$ ) free gases respectively. This work comprises of Quantitative measurement of all the macro species, ionic ( $\text{NH}_4^+$ ,  $\text{HCO}_3^-$ ) and gaseous ( $\text{NH}_3$ ,  $\text{CO}_2$ ) present in the draw solution at the normal temperature and pressure. This measurement can be of great help in determination of optimum conditions for the separation of the dissolved Ammonium Bicarbonate from the desalinated water in terms of temperature and pH of the solution.