

# Karl Fischer water determination

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## Introduction

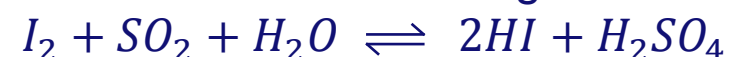
To determine accurately the water content in a liquid sample, Karl Fisher titration can be used. The Karl Fisher titration can measure water content in low ppm levels, and detects only water and no other molecules or volatiles. This makes the system very suitable for determination of low water content in solvents.



## Principle

Karl fisher water determination is an analytical water quantification method which makes use of a volumetric titration principle.

The titration is based on the following chemical reaction:



1 mole of  $I_2$  is consumed by each mole of water, a base must be added to drive the equilibrium reaction towards the right. The titration medium is known concentration of  $I_2$ .

The reaction produces  $I^-$ , making the liquid conductive, as soon as the reaction is completed  $I^-$  is consumed and only  $I_2$  is present, creating a sudden drop in conductivity. This conductivity is measured by 2 electrodes in the solution.

As soon as the reaction is complete the added amount of  $I_2$  is known and the water content can be calculated.

## Applications

- Determination of water content in solvents
- Determination of water in polymer dope solutions
- Both free and bound water determination

## Limitations

- pH must be between 5-7
- No Dimethylsulfoxide measurements, as the solvent reacts with the Iodine.