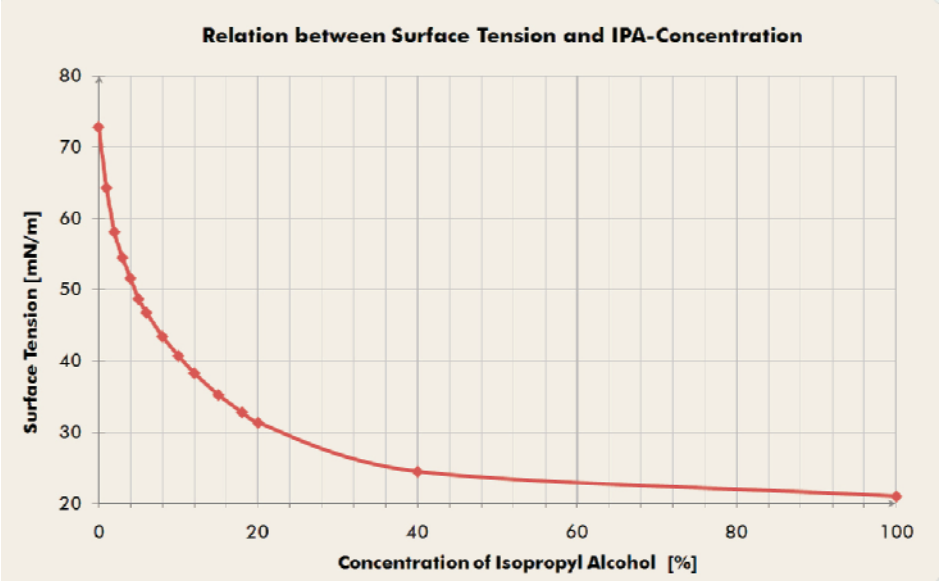
Reliable Monitoring of Isopropanol-Concentration in Etchant Solutions for Solar Cell Production

When producing solar cells, wafers are pre-etched to clean them or to remove a defined layer. Thereby, wetting agents, mostly isopropanol (IPA), are added to the etchant solution to reduce the surface tension. A problem is that a necessary convection while etching causes a fast evaporation of isopropanol. As a consequence, the surface tension of the etchant solution increases and the quality of the etching process decreases. Therefore, monitoring the surface tension is necessary in order to control the isopropanol concentration of etchant solutions. Static measurements such as the ring and plate method are not appropriate for this kind of analysis.

Innovative bubble pressure tensiometers of SITA Messtechnik GmbH help to find an optimal solution for every field of application due to a precise and quick measurement of the surface tension. In the diagram below you can see the relationship between the surface tension and the isopropanol concentration. The hand-held tensiometer SITA DynoTester and the process monitoring system SITA clean line ST are the most suitable measuring devices for monitoring etchant solutions.

SITA DynoTester is a flexible and light-weight device measuring the surface tension of etchant solutions very easy and quick. The SITA DynoTester is very user-friendly, so there is no expertise necessary in order to operate the device. Received measuring values can be compared with required values to find out if the isopropanol concentration is still within an acceptable range. In case of occurring deviations, it is possible find a prompt solution by adding an extra dosage immediately.



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The internal device storage can save up to 25 measuring results. An integrated USB port allows data transfer to the computer and serves as an external power supply. SITA DynoTester works at a measuring accuracy of a comparable laboratory device and is an optimal instrument to carry out random measurements of the bath's quality.

In some fields of application a constant monitoring of the bath's quality is needed. Here, an integrated process monitoring system for individual solutions, the SITA DynoLine, was developed in order to measure the surface tension of etchant solutions at regular intervals and to compare received surface tension data with limit values automatically. In case the received measuring results go below or beyond a defined range, a warning signal is sent out at any place. Therefore, it is possible to react within a short time when the isopropanol concentration does not correspond to the ideal concentration anymore. Furthermore, there is no employee needed for a permanent monitoring the isopropanol concentration.

Tensiometers of SITA Messtechnik GmbH monitor the isopropanol concentration reliably in order to achieve a high quality of the etching process and to avoid an isopropanol overdose.

SITA DynoLine

SITA DynoTester

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