

## Application note 15

### Determination of the dynamic contact angle on single fibres

#### Problem

The determination of the dynamic contact angles of fibres is of interest in various applications. The DataPhysics tensiometer of the DCAT series offers the possibility to determine the dynamic contact angles for single fibres as well as for fibre bundles. In the following example, the wettability of single fibres (coated cotton) with water was determined.

#### Method

For the control of the DCAT-instrument resp. of the measurement, the software module SCAT 32 was used. Four fibres were fixed on a special sample holder FH 12. Afterwards, all fibres were cut to the same length. The prepared length was approx. 1.5 cm. The sample probe FH 12 thus prepared was set into the DCAT-instrument.

#### Results

The mean contact angle with water as a test liquid is  $69.85^\circ$ , whereas a highly significant hysteresis between the advancing ( $101.27^\circ$ ) and receding ( $38.43^\circ$ ) contact angle could be observed. This leads to the assumption, that there are high adhesive forces at the solid/liquid interface.

Absorption of water by the fibres probably could be excluded, because there is no significant deviation within the subsequent cycles (Fig. 1).

#### Conclusion

The DataPhysics Tensiometer of the DCAT series in combination with Software Module SCAT 32 allows the reliable characterization of the wetting behaviour of single fibres. If you use test liquids with different polar and dispersive contribution, this method provides the base for the determination of surface free energy of single fibres resp. the adhesive behaviour of coatings to these fibres.

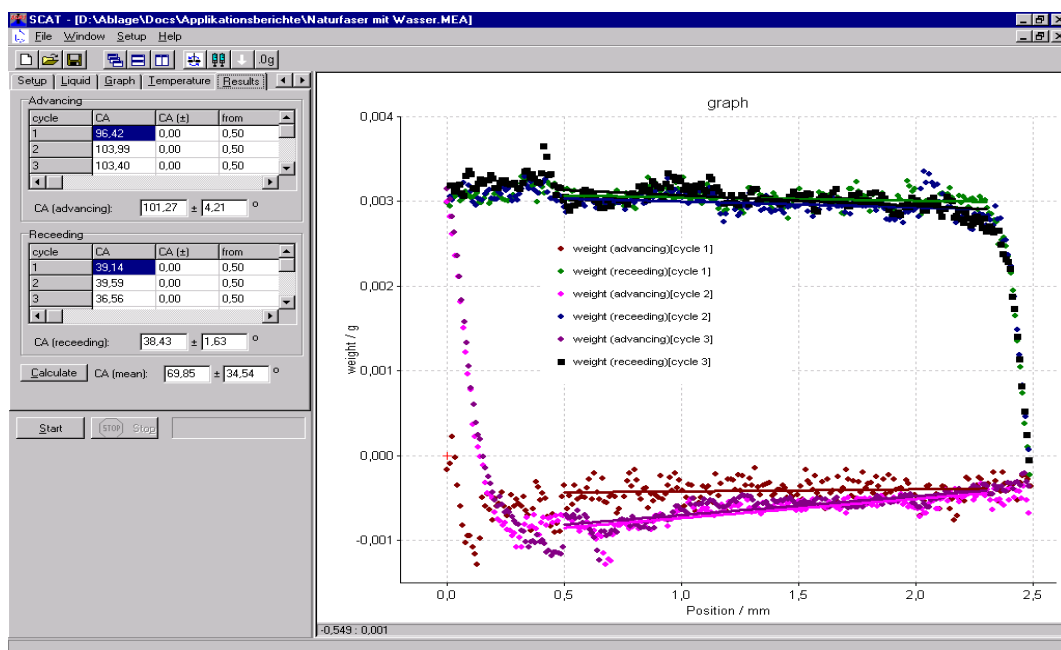


Fig. 1: Screen shot SCAT 32-Software – Advancing and receding contact angle