

PRELIMINARY METHODOLOGICAL EXPERIMENTS ON THE HYDROPHILIC/HYDROPHOBIC CHARACTER OF SOILS USING KRÜSS DSA 100 DROP SHAPE ANALYSER

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In our experiments, we used Krüss DSA 100 drop shape analyzer to test the wettability of different Hungarian soil and sediment samples, which measures the contact angle (cA) and water drop penetration time (WDPT), excellent indicators of the wettability of the solid phase. Two methods found in the literature were tested in the preliminary experiments. In the pastille method (PM), distilled water was dropped onto soil disc samples prepared at different pressures, and the cA and WDPT were measured. In adhesive stripe method (ASM) only the cA was measured. During our measurements, we varied the brightness according to our experience. We tested the corresponding frame rate values. We chose Sessile drop method with Young-Laplace fitting and automatic baseline adjustment. Calibration was performed before measuring each sample, measurements were performed in several replicates. The cA and WDPT was also measured by the PM on a series of previously hydrophobized soil samples treated with CPC cationic surfactant. The two sample preparation methods mentioned above (PM and ASM) were used to determine the hydrophobicity order of the soil samples. In PM measurements, a verifiable difference in cA values was observed for pastilles produced at different pressures. For both methods, the hydrophobizing effect of the cationic surfactant was clearly detectable. The results confirmed that the hydrophobic character determined by cA measurement and the measured WDPT values are closely related. The correct adjustment of the frame rate value may be crucial for accurate contact angle measurements.