Kelvin probe

Description:

It is a non-contact measurement system (Instytut Fotonowy, Krakow, Poland) that includes an oscillating capacitor consisting of two electrodes, the actual sample to be measured acting as one electrode and an oscillating gold grid reference electrode serving as the other. The device is further equipped with a radiation source for illuminating the sample with radiation of different wavelengths.

Thanks to the gas-tight Faraday chamber, the instrument enables the measurement of the electron work function in the same atmosphere in which the photocatalytic experiments themselves are carried out, allowing for a better correlation between the electron work function and the photocatalytic activity. The instrument is equipped with a software-controlled sample stage that enables measurements at different positions on the sample without the need to open the Faraday chamber.

Specification of adjustable parameters:

- Sample amount: 100 mg.
- Kelvin probe with the possibility of positioning the measured sample in the X and Y axes with a precision of 10 µm.
- Shielding of the sample from external sources and electrical noise using a gas-tight Faraday cage.
- LED radiation source with wavelengths of 836, 727, 625, 591, 530, 464, 425, 394, and 370 nm, as well as white light.
- Voltage range: −5 to 5 V.

Usage:

The Kelvin probe allows the measurement of the work function of various semiconductor materials in pellet form with high precision and accuracy. This information is used to characterize the surface properties of prepared semiconductor photocatalysts, e.g. corrosion, adsorption/desorption, surface charge, catalytic activity, etc.