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## Improved Adhesion of Platinum to Polymers

Poly(vinylidene fluoride) (PVDF), a polymer with piezoelectric properties, is extensively used in IR sensors, ultrasonic transducers, biomaterials and microactuators. Electrodes attached to the PVDF are conventionally made of copper and aluminium as they adhere well to its surface. More suitable inert metals, such as platinum and gold, with higher work functions, which would prevent current leakage, have not been used because of their poor adhesion.

Now, researchers in Korea have devised a method to enhance the adhesion of PVDF to platinum (S. Han, S. C. Choi, W.-K. Choi, H.-J. Jung, S.-K. Koh, K. H. Yoon and H. K. Lee, *J. Mater. Sci. Lett.*, 1999, **18**, (7), 509–513).

The surface roughness of PVDF sheets was increased when irradiated with Ar<sup>+</sup> ions in flowing oxygen at ~10<sup>-4</sup> Torr, and 1 keV potential. A platinum overlayer, ~100 nm thick, deposited by ion beam sputtering on the irradiated PVDF had greatly improved adhesion. The contact angle between irradiated PVDF and distilled water dropped from 70° to 31°.

Oxygen atoms may be partly replacing fluoride atoms on the carbon chain of the PVDF; hydrophilic functional groups related to oxygen are generated, aided by the ion assisted radiation. The hydrophilic groups may provide adsorption sites for the platinum metal layer, which results in enhanced adhesion.