Nonthermal plasma proved to be a more economical and ecological replacement of conventional technologies for various applications such as sterilization, NOx removal or surface treatment of polymers [1]. Microplasma has advantages over other types of nonthermal plasma due to its generation at low discharge voltage and atmospheric pressure.

This study introduces the surface treatment of polymer sheet developed for medical use using microplasma. The thickness of the sheet is less than 100nm. The sheet is fabricated for the medical use, and the adhesive force is important when is applied on wounds. Microplasma treatment was used in order to improve the adhesive force which is related to the hydrophilic property of the sheet. For the microplasma treatment of polymer sheet, the treatment area was wider then the case when corona discharge or plasma jet were used. Exitd species, radicals (OH) and ions generated by microplasma using process gases (Ar, N₂, Air) collided with the surface of polymer sheet [2]. The chemical bonds on the surface polymer sheet were changed due to the action of excited species, radicals and ions. The modification of polymer sheet surface was estimated by using contact angle meter and XPS (X-ray Photoelectron Spectroscopy).

This could be the result of the active species and UV photons responsible for attacking the C-H or C-C bond leading to the production of carbon radicals. Because C=O bond and O-C bond are hydrophilic groups and C-C and C-H bond are hydrophobic groups, the wettability of polymer surface could be improved. These results could explain the improvement of the surface’s hydrophilic characteristic.

Ar was more effective in surface treatment of polymer sheet towards a higher hydrophobicity than N₂ and Air. An increase of hydrophilic group and a decrease of hydrophobic group were measured by using XPS after microplasma treatment.

[Reference]