
Contemporary Plasma Science and Technology for Biomaterials in Thailand

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Abstract

Plasma technology has long been known in many important areas. But only in the recent years that plasma gains their footing for biomaterials applications in more contemporary fashion. Plasma is generated by applying electricity to gas to ionize and excite. Various energetic particles such as ions, electrons, photons, excited atoms and free radicals, are produced inside the plasma either from primary interactions between electrical field and gas atom and from subsequent interactions between primary energetic particles and the surrounding gas atoms. These energetic particles, once interacting with biomaterials such as rice and starch, can alter the interacting biomaterials to change their molecular structure; hence physico-chemical properties and eventually their macroscopic properties modification. This leads to a wide range of plasma applications, e.g., for rice at different stages of their life cycle; promoting the germination, sterilizing seeds and grains, improving cooking properties, modifying their texture for further processing, initiating cross-linking in rice starch, etc. Also, plasma is now available in various forms, for example, plasma torch, plasma needle, volume plasma, liquid plasma; giving more flexibilities for plasma applications. In this contribution, we will update some contemporary usages of plasma technology for biomaterials in Thailand.

Keywords: Agriculture, Starch, Rice, Surface Modification., Plasma Medicine