The Qualitative Analysis of Liquid Fuels Using Surface Plasmon Resonance System

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The Qualitative Analysis of Liquid Fuels Using Surface Plasmon Resonance System. The quality of fuel oil differs from country to country and even from manufacturer to manufacturer. In this study, it is aimed to design an analysis sensor that is able to measure the purity of liquid fuels by using the surface plasmon resonance (SPR) method. At the beginning of the project, we searched for methods to analyze the fuels qualitatively. Within these methods, we distinguished the methods that we can afford and we decided to produce a hand-made SPR biosensor. Although this method has not been tested on liquid fuels, we want to prove that our project can be used to increase the application areas of the SPR biosensor and to detect the purity of various substances such as liquid fuels. In this project, we tried to avoid the quality differences in the fuel by making an affordable SPR sensor accessible with all its components. In our experience, we have investigated the relationship between the SPR angle (physics) and the liquid sample, gasoline and some oils (biochemistry), and the index of refraction, as well as the interactions between molecules in the interface. The point that we observed is the changes of the resonance angle in the sensor. As a result, it is possible to have an idea about the purity of the fuels by looking at the fracture index and the deviation angle at the center of the prism. We have also realized that it is possible to calculate the antibody-antigen binding activity simultaneously. The results achieved in the experiment turned out to be in compliance with the angle resonance found out theoretically. The sensitivity level is around 97%, which is a highly satisfactory result.

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