

Detection of chemicals using fiber optic microfluidic sensor

ABSTRACT

Sensors have been applied in various aspects and fields. The integration of innovative micro fluidic system in sensors offer a development of the device with better performance, highly reliable and easy to use. In this study, a fiber opti micro fluidic sensor was fabricated using dry film resist for potential chemical sensing. The device was investigated and evaluated on its performance in terms of sensitivity, reproducibility, response time and detection limit of two model chemicals, Nickel(II) Nitrate Hex hydrate and Cobalt(II) Sulphate Heptahydrate. Results obtained show that the micro fluidic fiber optic sensor produced satisfactory detection towards both of the chemicals in terms of sensitivity, repeatability and response time. The response time towards Nickel (II) Nitrate Hex hydrate and Cobalt (II) Sulphate Heptahydrate were 77 s and 101 s respectively. The detection limit of the device towards both Nickel(II) Nitrate Hex hydrate and Cobalt(II) Sulphate Heptahydrate was around 0.1 mol/dm³. This suggest that the fabricated micro fluidic fiber optic sensor to be reliable for chemical sensing.

Keyword: Sensor; Fiber optic; Micro fluidic; Chemicals