ABSTRACT

The higher energy of UV-Vis light can remove electrons from atoms or molecules, resulting in ionising radiation. Sunlight exposure in specific doses benefits the body by increasing vitamin D production and killing bacteria, but overexposure can cause erythema, cataracts, and skin cancer. Based on analysis, lysine has potential as an active material for UV-Vis light detection, with the advantages of a wide measurement range and high sensitivity to radiation.

The lysine material is integrated with a signal conditioning circuit to facilitate reading the response through a GUI application. This circuit amplifies weak input signals, and the gain can be adjusted, although challenges in the form of noise can affect sensitivity. With this integration, the proposed UV-Vis photodetector is expected to overcome problems such as small output current and low sensitivity.

Test results show that the lysine-based sensor has the highest responsivity of 2.25 x 10^(-3)A/W at a wavelength of 405 nm and a detectivity of 2.08 x 10^9 jones. The sensor can detect current from 1 µA to 8 µA, with measured light wavelengths between 300-530 nm and 0-1000 W/m² intensities. The initial response time reaches 15-16 seconds, then stabilises at 1 second for real-time intensity readings.

Keywords: UV-Vis, Photodetector, Lysine, Responsiveness, detective, Signal Conditioning, GUI