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Smartphone-based fluorescence signaling of hypochlorite in tap water by oxidative hydrolysis of sulfonhydrazone

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Detection and control of biological and/or organic pollutants in drinking and industrial waters are of the utmost importance, especially if the final usage is for daily human consumption or the production of foodstuffs. Hypochlorite, ionized form of hypochlorous acid (HOCl), is particularly important because it is widely used in household and industrial area as cleaning agent, disinfectants, and sanitizers. Because of its widespread usage and an excess level of OCl- is potentially harmful to the health of human and animals, development of simple and convenient signaling methods for its industrial and environmental applications is imperative. Based on a sulfonhydrazone of 2-acetyl-6-methoxynaphthone, a new hypochlorite signaling probe 1 was developed. The designed probe exhibited prominent off-on type fluorescence signaling behavior toward hypochlorite in aqueous solution by hypochlorite-triggered oxidative hydrolysis of sulfonhydrazone. Hypochlorite signaling by a large fluorescence enhancement (76-fold) was possible with a detection limit of 3.8×10^8 M. The signaling of hypochlorite was not affected by the presence of other practical oxidants as well as common metal ions and representative anions. As a practical application, signaling of 1 for determination of hypochlorite levels in practical sample of tap water was conducted by using an easy-to-use smartphone as a detection tool.

Biography

Min Jeoung Cho is currently a master student in the department of chemistry at Chung-Ang University. Her research field is design of chemical probes for metal ions, anions and oxidative species.

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