

عنوان مقاله:

Sensitive nonenzymatic electrochemiluminescence hydrogen peroxide sensor using polypyrrole/ ployluminole / titanium dioxide nanoparticles

محل انتشار:

بیستمین کنگره شیمی ایران (سال: 1397)

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خلاصه مقاله:

A thin layer of a poly (pyrrole-luminol) composite was synthesized, through electrodeposition of luminol and pyrrole in acidic medium on a graphite electrode modified by casting of titanium dioxide (TiO₂) nanoparticles with 33 - 35 nm in diameter. The properties of the nanocomposite were studied by FE-SEM and EDX techniques. In alkaline media, luminol undergoes a two-step oxidation process at around 3440V and form excited luminol (3-aminophthalic acid dianion, the ring-opened intermediate form), which in turn emit light at 425 nm [1, 2]. Features of merit include broad linearity from 1pM to 4μM ($R^2= 34..6$) with a limit of detection as low as 3443 pM ($S/N=3$), good reproducibility (RSD of 44) for the analysis of a 443 μM hydrogen peroxide solution ($n=4$) and long-term stability. The presence of ascorbic acid at concentrations as high as 133 nM did not produce any electrochemiluminescence signals, which was held as proof of the selective behavior of the electrode modified with Ppy/Plu/TiO₂ towards H₂O₂ using method. The ECL process consumes luminol since this ring opened and the process is not reversible. The sensor was also used in the .analysis of H₂O₂ concentration in mouthwash formulations

کلمات کلیدی:

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