Mohamed O Amin et al., Mod Chem Appl 2017, 5:3(Suppl)
DOI: 10.4172/2329-6798-C1-006

5th Global Chemistry Congress

Novel and versatile solid-state chemiluminescence sensor based on TiO2-Ru(bpy)32+ nanoparticles for pharmaceutical drugs detection

Mohamed O Amin, Entesar Al-Hetlani and **Metwally Madkour**
Kuwait University, Kuwait

This work describes a novel and versatile solid-state sensor for analytes detection using $Ru(bpy)_3^{2+}$-Ce(IV). Herein, we report the synthesis, characterisation, optimisation and application of a new type of hybrid nanoparticles (NPs). Mesoporous TiO_2-$Ru(bpy)_3^{2+}$ NPs were prepared using a modified sol-gel method by incorporating $Ru(bpy)_3^{2+}$ into the initial reaction mixture at various concentrations. The resultant bright orange precipitate was characterised via: TEM, N_2 sorpometry, ICP-OES, Raman and UV-Vis spectroscopy techniques. The concentration of $Ru(bpy)_3^{2+}$ complex in the NPs was quantified and its chemiluminescence (CL) response was compared to the same concentration in the liquid phase using oxalate as model analyte. The results showed that this type of hybrid material exhibited higher CL signal compared to the liquid phase due to enlarged surface area of the hybrid NPs (~149.6 m^2/g). The amount of TiO_2-$Ru(bpy)_3^{2+}$. NPs and the effect of the oxidant flow rate were also investigated to optimize the CL signal. The optimized system was further used to detect oxalate and two pharmaceutical drugs; imipramine and promazine. The linearity of both drugs was in the range of 1-100 pM with limits of detection (LoD) of 0.1 and 0.5 pM, respectively. This approach is considered simple, low cost, facile and can be applied to a wide range of analytes.

Biography

Mohamed O Amin completed his Graduation at Kuwait University and currently pursuing MSc in Medicinal Chemistry.

mohamed.o.amin@hotmail.com

Notes: