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The behavior of emissive phenanthroline-iron(ii) charge transfer complex on ionic strength

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1,10-Phenanthrolin is a versatile bidentate ligand for transition metals. Their conjugated backbones make them attractive chromophores and molecular "antennae".[1] In this study, fluorescence emission of 1,10-phenanthroline probe and 1,10-phenanthroline-Fe(II) complex were examined in the presence of NaCl and $Pb(NO_3)_2$, in order to study relationship of the fluorescence of 1,10-phenanthroline-Iron(II) complex with the ionic strength. The fluorescence intensity of the probe at λ_{max} of 366 nm was decreased upon addition of Fe(II) which was mainly due to static quenching of unbound probe. A new red shifted emission band was appeared at 411 nm due to formation of probe-Fe(II) complex, which enhanced upon addition of Fe(II). The addition of NaCl and $Pb(NO_3)_2$ (1000 ppm) in acetonitrile medium to a solution of 1,10-phenanthroline-Fe(II) complex enhanced the emission at 411 nm, whereas no significant change was observed at 366 nm up to a concentration of 10^{-7} M of the salt. The emission of 1,10-phenanthroline-Fe(II) complex is highly dependent on the ionic strength of the solution regardless of the added cation and whether it has the ability to complex with phenanthroline or not up to a concentration of 10^{-7} M. These observations suggest that the emissive excited complex may be a charge transfer species and becomes more stable at higher ionic strength by minimizing the ratio of back electron transfer process in the ionic environment, leading to lowering of the quenching.

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Correlation of variation in the percentage of compounds responsible for mosquito repellent activity in citronella oil over time with mosquito repellent efficacy of commercial citronella oil samples and spray

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In tropical countries including Sri Lanka, mosquitoes are considered as the greatest menace out of all disease-transmitting insects because of their ability to spread mosquito-borne diseases, which are responsible for millions of deaths every year. Species of mosquitoes belonging to genera *Aedes*, *Anopheles*, *Culex* are the vectors of pathogens causing deadly mosquito-borne diseases such as Dengue fever, Filariasis, Japanese Encephalitis, and Malaria. The Epidemiology Unit of Ministry of Health Sri Lanka reported 185,969 suspected dengue cases during the year 2017. The control of mosquitoes, which transmit deadly diseases, has become a significant public health concern globally. Protection against mosquito bites is an important part of preventing mosquito-borne diseases. Using mosquito repellent products to keep mosquitoes away is currently the most trending method to prevent mosquito bites.

Cymbopogan winterianus Jowitt (Java type) and *Cymbopogan nardus* (L.) Rendle (Ceylon type) are the two types of closely related citronella grass cultivated to extract citronella oil. It is reported that compounds, geraniol, limonene, citronellol, citronellal, α-pinene, linalool, camphor, myrcene and α-terpeneol show
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