K21 Determination of Lignocaine Hydrochloride and Bupivacaine Hydrochloride in Pharmaceutical Samples Using Thermogravimetry, IR Spectrophotometry and Atomic Absorption Spectrophotometry

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After attending this presentation, attendees will understand the analysis and shortcomings of the anesthetics analysis countered as exhibits in case of anesthesia overdose. The short half-life and rapid degradation of these drugs have puzzled analysts for a fairly long period. Hence there was a need of an analytical method which would ensure the presence of drug in pharmaceutical samples, leftover vials, and such exhibits.

This presentation will impact the forensic science community by serving as a process aspect for a simple and rapid quantitative analysis of anesthetic drug overdose in cases where even qualitative analysis would have been difficult due to short half life of anesthetic drugs.

Ion associate complexes of lignocaine hydrochloride and bupivacaine hydrochloride with five metal tetrathiocynates (i.e., nickel, chromium, zinc, cobalt, manganese, and phosphomolybdate) were prepared. The precipitated ion associates were subjected to elemental analysis and further spectroscopic studies were done to determine the metal content and the association and stability of the metal-oxygen bond between the drug and the metal thiocynate. Solubilities of these solid ion associate complexes were studied and their solubility products were determined at different temperatures at the optimum pH for their quantitative precipitation. The thermodynamic parameters ΔH, ΔG, ΔS were calculated after the thermal studies for the dissolution of lidocaine and tetrathiocynates. The development of the AAS method was done by precipitating the drug in excess inorganic metal complex ions i.e.

tetrathiocynates and further determining the amount of excess metal ions unprecipitated by the drug by AAS. The method was applied for five metal tetrathiocynates and phosphomolybdate complexes in pure and pharmaceutical samples. The spectroscopic data revealed association of drug with metal with prominent M-O bonds indicating the stability of the drug metal complex. Further solubility and thermal studies revealed the physical and chemical characteristics of the complexes. The AAS studies of the complexes showed high precision and accuracy and gave a mean recovery of 99%. This research overcomes the shortcomings of analysis of anesthetics due to their short half life and minimal shelf life. **TG-DSC, AAS, Anesthetics**

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