



### A29 Ethylene Glycol in Medical Devices

*Irene Tan\*, Poh Ling Chia, BSc, Chin Chin Lim, MSc, MBA, and Yuk Lin Yong, BSc, Health Sciences Authority, 11 Outram Road, Singapore, 169078, SINGAPORE*

After attending this presentation, attendees will have learned of the methods employed in identifying the chemical content of hot/cold packs and the use of a derivatization technique to quantify the amount of ethylene glycol detected in these packs using gas chromatography-mass spectrometry (GC/MS).

This presentation will impact the forensic science community by discussing how ethylene glycol is a toxic substance. It was used in some local medical devices as an anti-freeze ingredient instead of the non-toxic propylene glycol. The results of laboratory analysis led to the recall of some Hot/Cold Packs from the local market.

The Medical Device Branch (Health Product Regulation Group) of Health Sciences Authority was first alerted to the possible presence of ethylene glycol in hot/cold packs due to a case of accidental poisoning in Australia when a young child chewed through the plastic packaging of a pack and consumed its content, which contained the toxic ethylene glycol. Ethylene glycol is harmful or fatal if swallowed. It may cause allergic skin reactions and can be harmful if inhaled or absorbed through the skin. Extended exposure over a period of time, if the compound is heated, may lead to pulmonary edema and central nervous system depression. As a result, the Medical Device Branch acquired fourteen types of the Hot/Cold packs from the local markets and submitted the packs to the laboratory for analysis.

The hot/cold packs were analyzed by fourier-transformed infrared spectroscopy, Raman spectroscopy, and gas chromatography-mass spectrometry. Of the fourteen types of hot/cold packs analyzed, five of them were found to contain the toxic ethylene glycol while the other nine types contained either propylene glycol, glycerol, sodium acetate, or water plus either a polyacrylamide or polyacrylate type polymer. All five of them were of the same brand. The qualitative analysis of the hot/cold packs and the quantitative analysis of ethylene glycol in these packs will be presented in the poster.

#### **Ethylene Glycol, Toxic, Hot/Cold Pack**