Quality Evaluation of Ibuprofen and Quinine Sulphate Formulations Sold on the Market in Angola Using Differential Scanning Calorimetry Technique

M. L. Vueba
University of Coimbra

**Purpose**
It was intended to use differential scanning calorimetry (DSC), extensively applied for evaluation of physico-chemical interactions between drug and excipients.

**Methods**
The formulations analysed included tablets of quinine sulphate and ibuprofen sold in black market in Angola. The tablets were studied using a differential scanning calorimeter (Shimadzu TA-50); the system was purged with nitrogen gas at the rate of 20mL/min to maintain an inert atmosphere. The samples were hermetically sealed in aluminium pans and heated between 25°C and 350°C.

**Results**
The evaluation of the DSC curves were analyzed according to the postulate by Van Dooren and Duphar. DSC trace of ibuprofen, displayed a single sharp endothermic peak at approximately (T peak = 76.19°C, T onset = 68.26°C) corresponding to its melting point; whereas, the thermal curve of quinine sulphate, showed a single sharp endothermic peak that was detected at T peak = 117.03°C to 123°C, corresponding melting point of the drug. These results can be justified by the lowering of the melting point due to the mixing, or they can indicate some possible interaction effects. In fact, the thermal characteristics of different forms of quinine sulphate by DSC can arise many sharp melting endotherm quinine indicating it to be a new polymorphic form. The presence of different excipients in quinine tablets) and also the storage conditions of those formulations may lead the desolvolution an exo- therm between the desolvation endotherm and the melting endotherm appears which shows that once the solvent leaves, the lattice of the drug molecule reorganizes itself and revert back to original form as the melting temperature and enthalpy of fusion are similar to that of original form.

**Conclusion**
It is clear, from this study and others that drugs sold in public markets are often fake or substandard. From the DSC analysis of different sold tablets of ibuprofen and quinine sulphate show some different changes related to the storage conditions that can affect the bio ability of the drug. Moreover, compatibility between those drugs and the excipients were observed. The present study demonstrates the successful application of the DSC technique to assess compatibility.