

# Preparation of Fatty Acids Salts of Some Lanthanides and Studying their Effects in the Thermal Degradation of PVC

A Thesis  
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## SUMMARY

The study is included the preparation of some metallic soaps derived from lauric, Myristic and Stearic acids and the metals; lanthanum, Cerium, praseudimium and Neudymium, which are used as thermal stabilizers for PVC.

The soaps are identified by their electronic, infrared and mass spectra as well as microanalysis. DSC technique is also used to investigate whether these compounds posses any liquid crystalline properties. Their melting points, DSC analyses and polarized microscope showed that there may be some kind of liquid crystalline properties.

The prepared soaps are used as thermal stabilizers for PVC awing to there ability to capture HCl gas that evolved from PVC through its thermal degradation thus minimizing the destructive role of HCl gas in catalyzing the thermal degradation of PVC. As well they are able to form ester linkage with the PVC chain through substituting the labile chlorine atoms on the polymeric chain by carboxyl groups.

IR spectroscopy is used to study the stabilizing effects of the soaps within the range  $1900-1470\text{cm}^{-1}$ . The spectra are followed for a thin films of mixtures of PVC and the given soap at  $194^{\circ}\text{C}$  in the air and in few cases in nitrogen.

IR spectroscopy is found to be suitable to trace the consuming of the soaps within the thermal stress periods via asymmetrical stretching vibration of the carboxylate group at  $1540\text{cm}^{-1}$ . This subject is also followed thermogravimetrically, and the TG curves of mixtures of PVC and the investigated soaps demonstrated the stabilizing action of these compounds through increasing the thermal degradation temperature of the stabilized PVC as a compared with unstablized PVC.

The results are found to be in agreement with previous works in the same field and those works are used to interpret and support our findings.