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CHOOSRI UTAIWASIN : DEVELOPMENT OF POLYVINYLIDENE FLUORIDE AS PYROELECTRIC POLYMER AND ITS APPLICATION. THESIS ADVISOR : ASSO. PROF. ANUNTASIN TECHAGUMPUCH, Ph.D. 84 PP. ISBN 974-584-337-7

In this research work, a method for determining the pyroelectric coefficient of PVDF has been developed. A film completely covered with thin plastic was dipped in warm oil. The temperature increase (ΔT) of the film was measured by a thermistor which has an accuracy of about 0.1°C. The charge transferred between electrodes of the film (Q) has been determined using an electrometer. It was found that the relation between Q and ΔT is linear when $\Delta T \lesssim 4$°C. The pyroelectric coefficients (p_3) of available PVDF films obtained from $Q/\Delta T$ are found to be between 0.34-1.91 nC/cm^2K. The plot between the pyroelectric (p_3) and piezoelectric coefficients (d_{31}) of each film tended to be a straight line, as was predicted by various theoretical models of piezo-pyroelectricity of PVDF films.

For the films of high p_3, a temperature increase of 0.2°C in these films produced a voltage of about 1 Volt between their electrodes, which is enough to trigger many devices. From this principle various kinds of electronic switches and also highly sensitive infrared detectors have been developed.