

## C325446 : MAJOR PHYSICS

KEY WORD: PIEZOELECTRIC / PIEZOELECTRIC COEFFICIENT/ POLYVINYLDENE FLUORIDE  
TEARAPON YAMWONG : MEASUREMENT OF PIEZOELECTRIC COEFFICIENT OF  
POLYVINYLDENE FLUORIDE FILMS AT LOW FREQUENCIES. THESIS ADVISOR :  
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In this research, an apparatus for measuring the piezoelectric coefficient ( $d_{31}$ ) of PVDF at 10 Hz was developed. This apparatus has a moving coil which generated a sinusoidal force on the film and an electric circuit for measuring the electrical signal from PVDF films.

There are two methods for measuring  $d_{31}$  of PVDF films. By the first method two PVDF films are connected in series, one of which is a reference film for which the coefficient  $d_{31}$  is known from a previous DC measurement. The current is applied to the moving coil to obtain an rms voltage of 0.800 V from the reference film, and then the voltage at the other film is measured. From this method,  $d_{31}$  of the second film can be calculated.

By the second method, only one film is used at a time. The voltage of the reference PVDF is measured when the rms current applied to moving coil is 0.750 A. Then the rms force exerted on the reference film by this current is calculated. In obtaining  $d_{31}$  of other films, the rms voltage produced by the film mounted at the same position as the reference film, and when the same current is applied to the moving coil, is recorded. Since the rms force on this film is known, the  $d_{31}$  of the film can be calculated.

It was found that the difference between the DC  $d_{31}$  and AC  $d_{31}$  for various films was 0 - 17% when using the first method and 2 - 11 % when using the second method.