



Ferroelectric (composite) are usually a mixture of a ferroelectric material embedded in a matrix, to exhibit the piezoelectric and pyroelectric properties to manufacture related sensors , devices , capacitors etc. To induce piezoelectric and pyroelectric activities, a ferroelectric composite must undergo a poling procedure in order to orient the spontaneous polarization of the ceramic phase. A common method to observe this process is a hysteresis loop. Here a periodical (mostly sinusoidal at line frequency) field is applied to the sample, while the polarization reversal current or charge is monitored. These measurements allow to determine of the remanent polarization ( $P_r$  , the amount of polarization after the polling field is zero) and, the coercive field ( $E_c$ , the reverse field required to switch back the previous state,  $P_r$  equal to zero), which are the characteristics features of ferroelectric materials.

**P - E loop measurement :-** The most quoted method of measurement such hysteresis loop is based upon 'Sawyer anf Tower' measurements, which includes some seminal measurements on 'Rochette salt' ( $NaKC_4O_8$ ). The schematic is same as to measure hysteresis loop in ferromagnetic materials. The applied field is in form of line voltage at line frequency , while the charge current is passed through a large value capacitor to convert it in voltage.

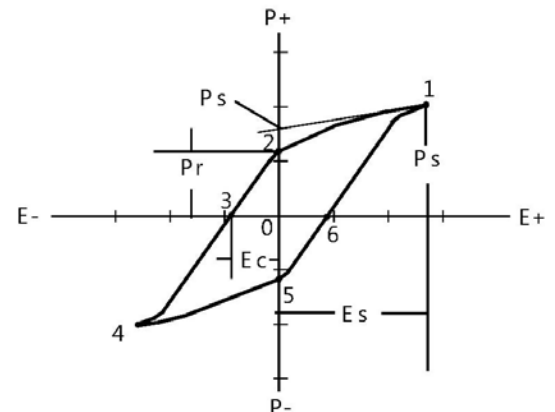
### SPECIFICATIONS :

#### Sample :

Ferroelectric composite	: $CaTiO_3$ or equivalent
Thickness d	: 1.76mm approx.
Diameter	: 8.70 mm. approx.
Area	: $18.93 \times 10^{-2}$ cm. Approx.
Sample holder	: 1no.
Field Supply	: DC output 0 - $\pm 100V$
Observation	: On Simple C.R.O. With switch provided to scan in hi & lo frequency.
Controls	: Three 1. For Voltage control 2. For Gain control 3. For Phase control
Voltmeter	: 1no. for voltage
Power	: 220V , 50Hz
Manual	: Provided with setup & necessary patch cord

#### Optional :

C.R.O.	: 1nos.
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Photographs are for reference only final product may vary from it

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