

PORNSUNTI JITJAENG : APPLICATION OF OSCILLATION PROPERTY OF QUARTZ
IN THICKNESS MONITORING OF THIN FILM. THESIS ADVISOR : ASSO.PROF.
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The investigation was to apply the oscillation property of quartz in thickness monitoring of thin film while evaporating a metal in an evaporator, on the principle that the resonance frequency at which the quartz crystal oscillates is lowered by the addition of material to its surface. An apparatus to monitor film thickness was constructed by using a quartz crystal as the basic sensing element. A microcomputer program measured the frequency and calculated the frequency change of the sensor crystal.

A number of microscopic slides were used as substrates. Each slides were carefully weighed and recorded before being deposited with copper. Each evaporation was discontinued for corresponding frequency change of the sensor crystal. The plot of mass changes of the slides against the frequency changes was found to be approximately linear. A calibration curve between the film thickness calculated from the film mass against the film thickness calculated from the frequency change was plotted. Using the best value of the slope, the constants in the computer program was modified. Another set of evaporation process was carried out for testing. The results were found to be consistent.