Experiment (2): Coefficient of Static Friction

Result and Discussions:

The purpose: Of this Lab experiment is to measure the static coefficient of friction $\mu_s$ between a block and a surface by measuring its inclination.

Equipments (Apparatus): Block, Coefficient of Static Friction apparatus, and balance.

Theory: Friction is a force that resists the motion of one surface in contact with another, there are two types of friction: Static friction and Kinetic Fraction.

Formula of Static friction:
- If the body in horizontal:
  \[ f_s = \mu_s N \]  \hspace{1cm} \text{(1)}
- If the body inclined at angle and at equilibrium:
  \[ f_s = mg \sin(\theta) \] \hspace{1cm} \text{(2)} \quad \text{and} \quad N = mg \cos(\theta) \hspace{1cm} \text{(3)}

Sub. From (2),(3) in (1)
\[ mg \sin(\theta) = \mu_s mg \cos(\theta) \implies \mu_s = \frac{\sin(\theta)}{\cos(\theta)} = \tan(\theta) \]

Result:

Mass of block = 103g

$\theta_1 =$ ...................................... $\theta_2 =$ ...................................... $\theta_3 =$ ......................................

Mean Value of $\theta = \frac{\theta_1 + \theta_2 + \theta_3}{3} =$ ......................................

$\mu_s = \tan(\theta) =$ .................................................................