Use an adjustable incline plane for which the rod supporting the upper end has been calibrated to read directly the tangent of the angle of inclination. Place the body to be studied at the upper end of the plane, gradually and very gently increase the angle until the body just starts to slide, and clamp the plane in position. The tangent of the angle, read from the rod, is the coefficient of static friction. (See Note 1.)

The area of one face of part A of the aluminum specimen is twice the area of the other face. Determine the coefficient of each face sliding on the plane. Note that the coefficient is essentially independent of the area of contact. (See Notes 2 and 3.)

Parts A and B of the aluminum specimen have equal weights. Place part B on top of A, thus doubling the weight, and show that the coefficient is essentially independent of weight. (See Note 4.)

The four sides of the wooden block furnished have quite different surfaces, smooth wood, rough wood, Teflon and rubber. Determine the coefficient of static friction for each surface on the plane. Note that the rough wood and the smooth wood, on the same smooth wood plane, have coefficients that are not greatly different. (See Note 5.)

Notes: (1) If you wish to check the calibration on the rod, the sine of the angle, and thence the tangent, can be obtained by measuring the heights of the pivots at the ends of the plane above the table and knowing that the distance between pivots is 100.0 cm. (2) The coefficient of friction varies from one point to another on any but the most uniform surface. Appreciable variations in measured coefficients should therefore be expected. (3) Except when heating due to sustained braking becomes a factor, a car with standard tires can be stopped as rapidly as one equipped with super-wide tires. (4) A heavy car can be stopped as rapidly as a light car, the proportionately larger friction due to the greater weight being just enough to produce the same deceleration of the larger mass. (5) The coefficients of friction for a smooth tire and for a tire with relatively good tread are not greatly different on a dry concrete or asphalt road.