

Answer on Question #72083 Physics / Other

The coefficient of kinetic friction between a rock and an aluminum part of a spacecraft is $\mu = 0.35$. If the ship has a mass of $m = 400\text{kg}$ and slides horizontally at a constant speed over the surface of Venus ($g = 8.87 \frac{\text{m}}{\text{s}^2}$), what is the magnitude of the friction force?

Solution:

The magnitude of the friction force by definition

$$F_{\text{fric}} = \mu N,$$

where N is normal reaction force. At the horizontal surface

$$N = W = mg.$$

Thus

$$F_{\text{fric}} = \mu mg.$$

$$F_{\text{fric}} = 0.35 \times 400 \times 8.85 = 1239 \text{ N}.$$

Answer: 1239 N.

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