

What is the buoyant force on a helium balloon with a radius of 30cm in air if density air = 1.29 kg/m<sup>3</sup>?

Solution:

Let:

$$R = 30\text{cm} = 0,3\text{m}$$

$$\rho(\text{air}) = 1,29 \text{ kg/m}^3$$

$$F = ?$$

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According to Archimedes' principle:

$$F = (\rho(\text{air}) - \rho(\text{He})) * V * g = (\rho(\text{air}) - \rho(\text{He})) * \frac{4}{3} \pi R^3 * g$$

$$F = (1,29 - 0,178) * \frac{4}{3} * 3,14 * 0,3^3 * 9,8 = 1,23\text{N}$$

**Answer:**

**1,23N**