gr. HI – 17 - 2021

Calculation task № 13

Volumetric flow rate of the liquid of the oil well is 9.5 m^3 per hour. What is the mass daily production rate of oil and water (in tons/day), if their densities are 875 and 1040 kg/m^3 respectively and the production water cut is 36 % ?

$Q = 9.5 \quad \frac{m^3}{hour}$

$\rho_o = 875 \quad kg/m^3$

$\rho_w = 1040 \quad kg/m^3$

$n_w = 36 \quad \%$

Determine : mass daily production rate of oil and water (in tons/day)

$Q_{m.o.}$ - ? $Q_{m.w.}$ - ?

Solution

Mass daily production rate of oil :

$$Q_{m.o.} = Q \cdot \rho_o \cdot \left(1 - \frac{n_w}{100}\right)$$

(production water cut – in fractions).

$$Q_{m.o.} = Q \cdot \rho_o \cdot \left(1 - \frac{n_w}{100}\right) = \_\_\_\_\_ = \_\_\_\_\_ \ \frac{kg}{hour}$$

$$= \_\_\_\_\_ \cdot 24 = \_\_\_\_\_ \ \frac{kg}{day} = \_\_\_\_\_ \ \frac{tons}{day}$$

Mass daily production rate of water :

$$Q_{m.w.} = Q \cdot \rho_w \cdot \frac{n_w}{100} = \_\_\_\_\_ = \_\_\_\_\_ \ \frac{kg}{hour}$$

$$= \_\_\_\_\_ \cdot 24 = \_\_\_\_\_ \ \frac{kg}{day} = \_\_\_\_\_ \ \frac{tons}{day}$$

Answer : Mass daily production rate of oil $Q_{m.o.} = \_\_\_\_\_ \ \frac{tons}{day}$

mass daily production rate of water $Q_{m.w.} = \_\_\_\_\_ \ \frac{tons}{day}$