

$$D_{\text{ata}} = \frac{160}{33} + 1 = 5.85$$

$$SP = 1.2$$

$$DF = 1.0$$

$$TED = 5.2 \text{ g/L}$$

$$w = \frac{D_{\text{ata}} - SP}{D_{\text{ata}} - DF} = \frac{P_{N_2+He}^{\text{loop}}}{P_{N_2+He}^{\text{DIL}}} = \frac{4.65}{4.85} = 0.959$$

$$F_{O_2}^{\text{DIL}} = \frac{DF}{D_{\text{ata}}} = \frac{1.0}{5.85} = 0.17$$

$$\begin{aligned} F_{He}^{\text{loop}} &= \frac{SP \cdot d_{O_2} + (D_{\text{ata}} - SP) \cdot d_{N_2} - TED}{D_{\text{ata}} (d_{N_2} - d_{He})} \\ &= \frac{1.2 \times 1.428 + 4.65 \times 1.251 - 5.2}{5.85 \times 1.072} \\ &= \frac{2.33}{6.27} \\ &= 0.372 \end{aligned}$$

$$\therefore F_{He}^{\text{DIL}} = \frac{F_{He}^{\text{loop}}}{w} = \frac{0.372}{0.959} = 0.387$$

Diluent mix is

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