

For a  $300\text{ cm}^3$  sample bottle, the following equation relates PPM by weight  $\text{N}_2$  in liquid argon to sample bottle pressure

$PPM_w$  = Parts per million nitrogen in liquid argon by weight.

$psig$  = Sample bottle pressure, cryostat assumed to be at 2 psig.

$depth$  = indicated liquid depth, level probe must be submerged to use this equation.

$$PPM_w = \frac{45.94 \times psig}{11.42 \times depth + 104.2}$$

$$\frac{PPM_w \times (11.42 \times depth + 104.2)}{45.94} = psig$$

Nitrogen in the argon vapor phase will have 3.07 times the concentration by weight than in the liquid phase.

For example, if there are 89 liters of liquid in the cryostat, the amount of nitrogen required to create 1  $PPM_w$  in the liquid is  $2.7323 \times 10^{-4}$  lb. If  $2.7323 \times 10^{-4}$  lb of  $\text{N}_2$  (103.3 cc) is added to the cryostat, the result will be 3.03  $PPM_w$  in the vapor phase and 0.987  $PPM_w$  in the liquid.