$$|\Delta T_f| = 6.55^\circ C - 4.28^\circ C$$

$$= 2.27^\circ C$$

$$|\Delta T_f| = K_f \cdot C_m$$

$$\downarrow$$

$$C_m = \frac{|\Delta T_f|}{K_f} = \frac{2.27^\circ C}{20.0 \frac{^\circ C}{m}}$$

$$= 0.1135\ m$$

$$0.1135 \frac{mol}{kg} (0.01500\ kg) = 0.00170\ mol$$

$$MWT = \frac{0.338\ g}{0.00170\ mol} = 199 \frac{g}{mol}$$

$$\Pi = M \cdot R \cdot T$$

$$2.37\ g \left(\frac{1\ mol}{82100\ g}\right) = 2.887 \times 10^{-5}\ mol$$

$$M = \frac{2.887 \times 10^{-5}\ mol}{0.0458\ L} = 6.303 \times 10^{-4}\ \frac{mol}{L}$$

$$\Pi = \left(6.303 \times 10^{-4}\ \frac{mol}{L}\right)\left(0.08206\ \frac{L\ atm}{K\ mol}\right)(298\ K)$$

$$= 0.01542\ atm$$

$$0.01542\ atm \left(\frac{760\ torr}{1\ atm}\right) = 11.7\ torr$$

$$MWT = \frac{m}{n} = \frac{3.12\ g}{4.048 \times 10^{-5}\ mol}$$

$$= 7.71 \times 10^{4}\ \frac{g}{mol}$$

$$M = \frac{n}{V} \rightarrow n = M \cdot V$$

$$n = M \cdot V$$

$$= \left(0.001205\ \frac{mol}{L}\right)(0.0336\ L)$$

$$= 4.048 \times 10^{-5}\ mol$$

$$\Pi = MRT \rightarrow M = \frac{\Pi}{RT}$$

$$22.4\ torr\left(\frac{1\ atm}{760\ torr}\right) = 0.02947\ atm$$

$$M = \frac{0.02947\ atm}{\left(0.08206\ \frac{L\ atm}{K\ mol}\right)(298.15\ K)}$$

$$= 0.001205\ \frac{mol}{L}$$