# cheg325 homework 4 sis 10.1-14

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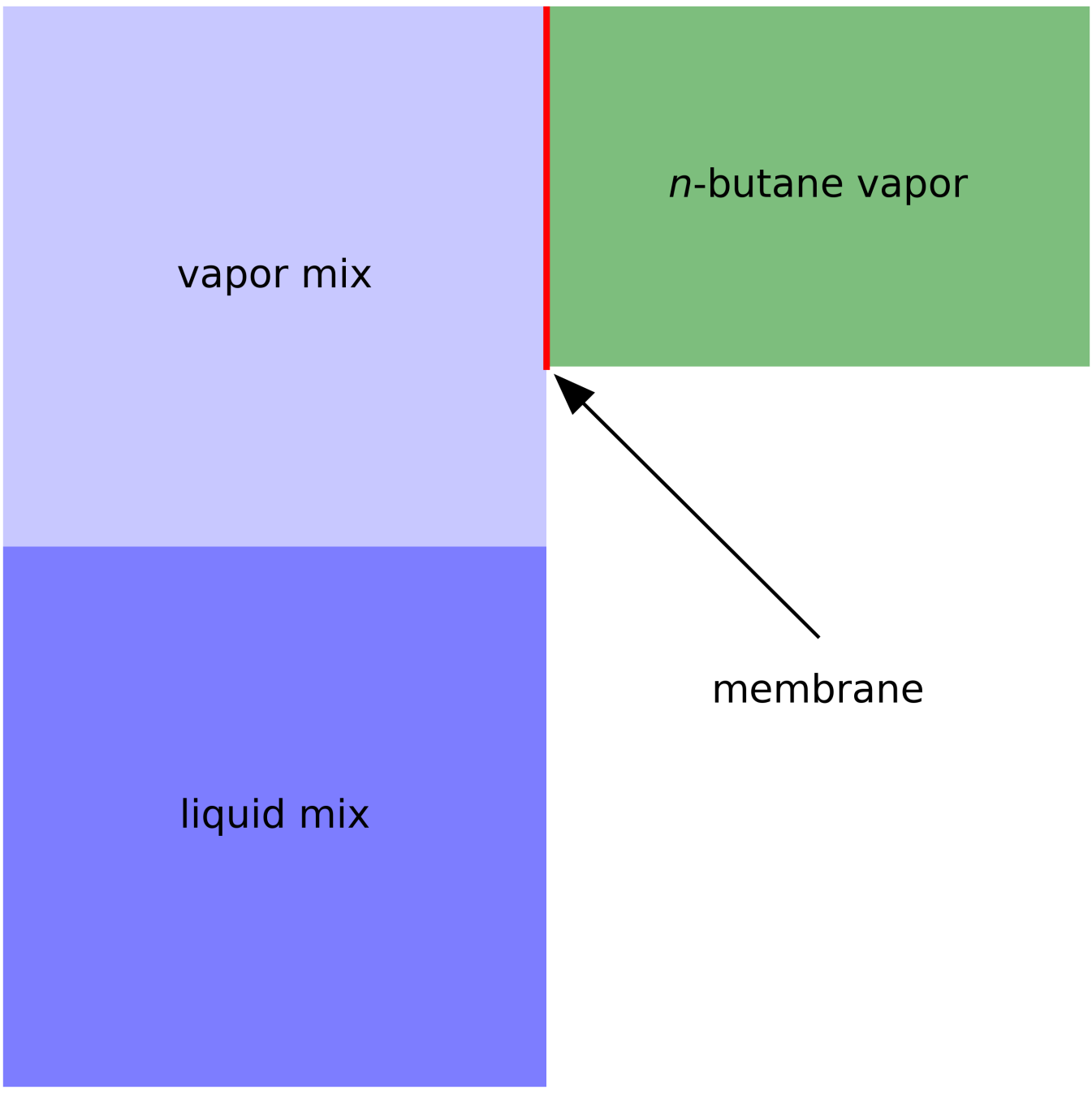
here's my interpretation of sandlers drawing

▶ Code




at equlibrium the partial pressure of $n$-butane needs to be the same on both sides of the membrane. This makes this problem our `bubble p` problem since we know the temperature and composition of the liquid.

just writing out raoults law for myself

$$x_i P_i^{\text{vap}} = y_i P_{\text{total}} = P_i$$

▼ Code

```
pvap_butane = 2.583
pvap_hexane = 0.218
p_butane = 0.6 # bar

x_butane = p_butane / pvap_butane
x_hexane = 1 - x_butane

p_hexane = x_hexane * pvap_hexane
p_total = p_butane + p_hexane

y_butane = x_butane * pvap_butane / p_total
y_hexane = x_hexane * pvap_hexane / p_total

print(f'----- liquid composition -----')
print(f'hexane: {x_hexane:.3f}')
print(f'butane: {x_butane:.3f}\n')

print(f'----- vapor composition -----')
print(f'hexane: {y_hexane:.3f}')
print(f'butane: {y_butane:.3f}\n')

print(f'pressure: {p_total:.3f} bar')
print(f'temperature: {300} K')
```

```
----- liquid composition -----
hexane: 0.768
butane: 0.232

----- vapor composition -----
hexane: 0.218
butane: 0.782

pressure: 0.767 bar
temperature: 300 K
```

▼ Code

```
# filler
```