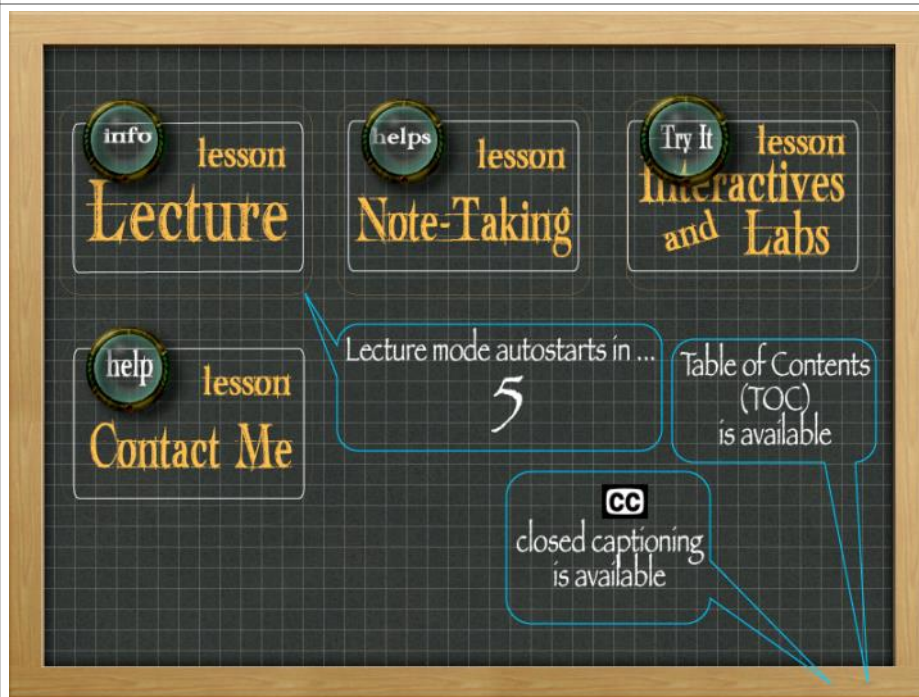


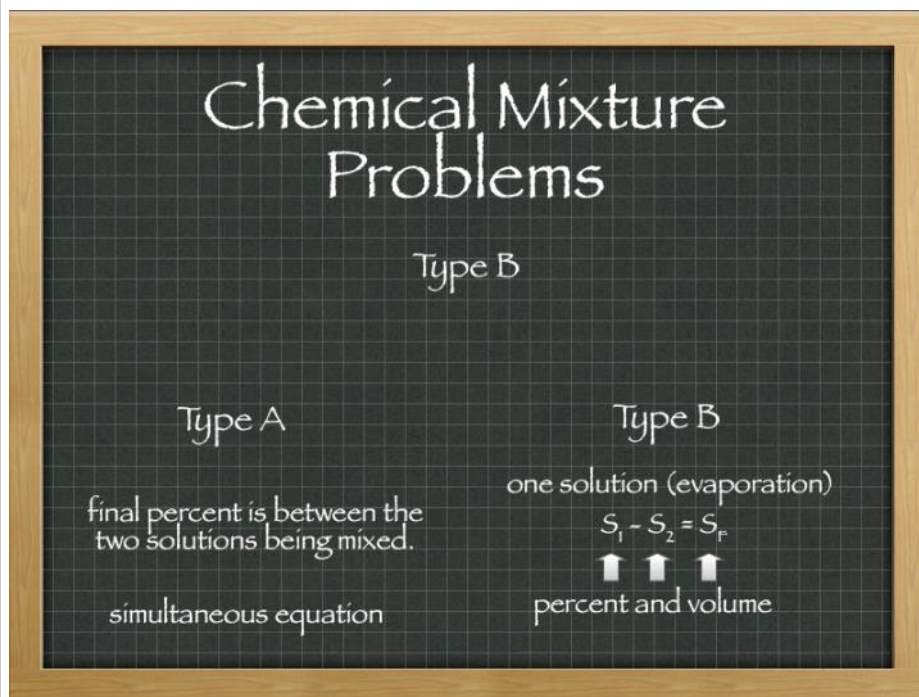
Chemical Mixture Problems, Type B

Thursday, January 19, 2012
5:16 PM

Slides



Notes



Chemical Mixture Problems, Type B. You have learned to do the type A chemical mixture problems. In those, the final percent concentration is between the concentrations of the two solutions being mixed and the process to solve those are two solve them as you would a simultaneous equation.

In type B, you will be targeting a solution that will only need one equation instead of two. The three terms will combine the concentration percent, written as a decimal, with the volume .

Let's try one.

How much water must be evaporated from 100 ml of a 10% solution of iodine

iodine
10%

target
40%
iodine

100 mL initial volume

evaporation

$$S_1 - S_2 = S_f$$

percent and volume

$$0.10(100) - 0(E) = (0.40)(100 - E)$$

$$10 = 40 - 0.4E$$

$$\begin{array}{r} -40 \quad -40 \\ \hline -30 = -0.4E \\ \hline 0.4 \quad 0.4 \\ \hline 75 = E \end{array}$$

from 100 mL of a 10% solution of iodine to get a 40% iodine solution?

Here is our pattern for the equation.

Now let's combine the percent concentrations and volumes. S1 is the original concentrations and volume.

The S2 term is the one that will be the evaporation.

S3 will be the final goal percent concentration and the volume needs to be the original minus what is removed through evaporation so you get 100 - E in this instance.

Now just solve for the volume of water that needs to be removed, E.

evaporation

$$S_1 - S_2 = S_f$$

percent and volume

How much water must be evaporated from 50 mL of a 30% solution of saltwater to get a 80% salt solution?

Drag and drop the percents (in decimal form) and volumes to their correct place.

0 0.80 0.30

50 50 - E E

S_1 S_2 S_f

percent volume percent volume percent volume

Undo Reset Submit

Setting up the equation is the main task to get a handle on since once you have that, solving for E is a pretty normal algebraic task. Try your hand at setting up the equation for this one.



Congratulations!
You have completed
this topic