Worksheet - Techniques for the Separation of Mixtures

Safeties

1) $AgNO_3$ silver (I) nitrate - Don't get it on your hands. It will oxidize your hands and turn them brown. Known as an oxidizer.
2) $KMnO_4$, potassium permanganate - Don't get it on your hands. It will oxidize your hands and turn them brown. Known as an oxidizer
3) KNO_3, potassium nitrate - Affects your libido, wash your hands.

Oxidizers remove electrons from chemical bonds that hold your skin together. The chemical process called oxidation causes the loss of electrons. (OIL - oxidation is loss of electrons) Mantra: In order to become a postive person, I must lose negative thoughts... OIL

2) Boiling water a) never leave a Bunsen burner unattended
b) never fill a beaker more than 2/3 full
c) always use a boiling chip (1-3 chips)
d) never add a boiling chip to hot solutions

3) Balance the centrifuge
a) Use a thick walled test tubes
b) Place equal amounts of solutions in each thick walled tests and center them across from each other.

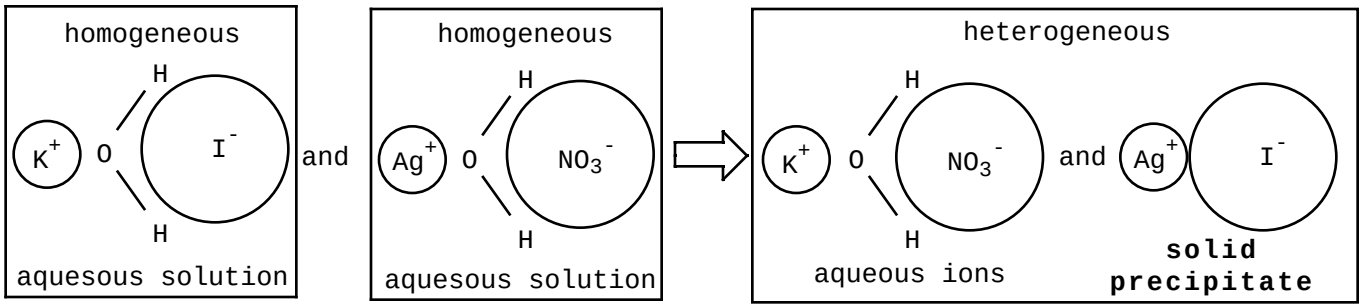
4) Distillation
a) never heat a closed system
b) never fill a flask more than 2/3 full
c) always use a boiling chip (1-3 chips)
d) never distill to dryness

The reaction in today's experiment use aqueous solutions
a) Solutions = solute plus solvent
b) $KI_{(aq)}$, aqueous potassium iodide
c) $AgNO_{3(aq)}$, aqueous silver (I) nitrate
d) the reaction is a DOUBLE DISPLACEMENT of ions in solution.

The Submarine Reaction - A test of salinity in pure water

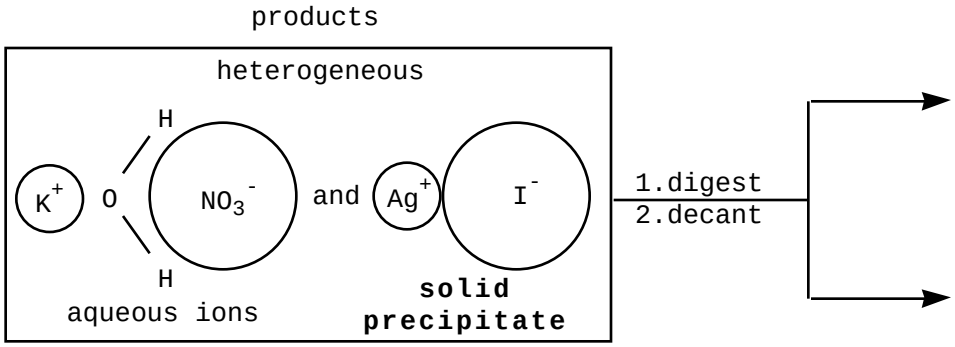
$$KI_{(aq)} + AgNO_{3(aq)} \longrightarrow KNO_{3(aq)} + AgI_{(s)}$$

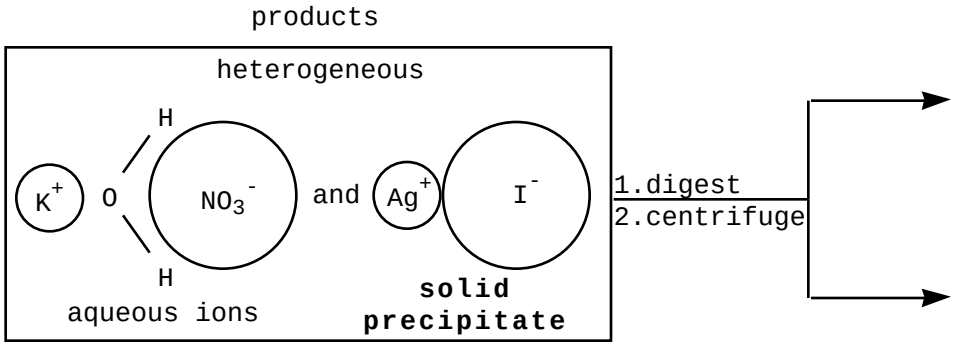
reactants products



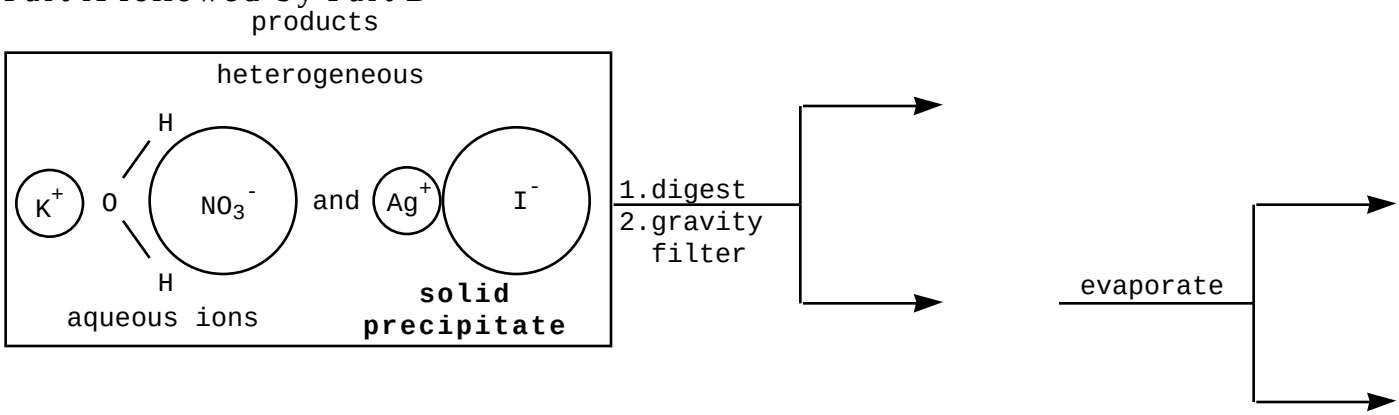
Physical Separations

Part A

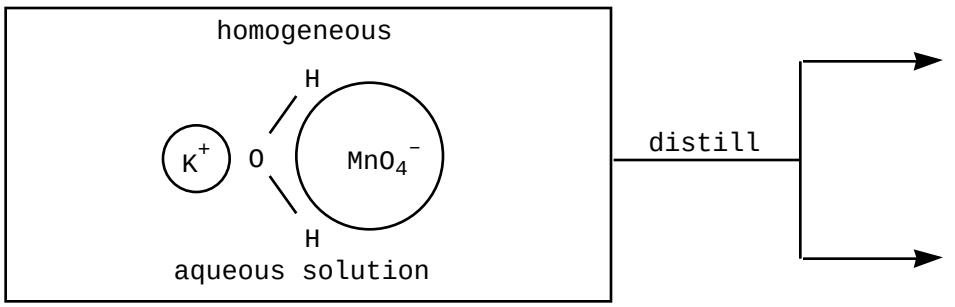




Part A followed by Part B



Part B - Distillation of an Aquesous Solution of Potassium Permanganate



Name:_____

Suppose that you had a three separate bottles of equal amounts of aqueous solution: aqueous silver (I) nitrate; aqueous potassium iodide, and aqueous ethyl alcohol AND you mix all three contents into one container.

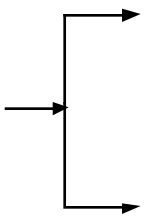
1. Based on your results in this experiment, what would be observed after all three bottle contents are mixed? What reaction will occur? As for ethanol, that is drinking alcohol, it is soluble in water and does not react.

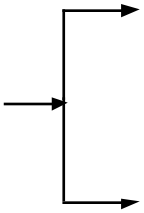
2. All components in the resulting mixture are listed in the table below except for _____. Write this component into the table.
3. Give the physical state of each component in the mixture.
4. If you wanted to recover each component in pure from the mixture above, which of method(s) of separation studied in this experiment would you use and why?

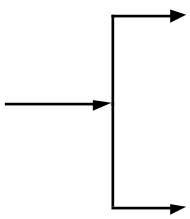
Chemical Name	Chemical Formula	physical state in water aq, s, l, g	name the proposed method for separation of the component from the mixture	briefly explain your choice of method for the separation
silver (I) iodide				
potassium nitrate				
ethyl alcohol		(l)		

4. After mixing, show how the methods studied in this experiment can be used separate of all components into their pure form. Diagram a flow chart separation scheme—started like the one below—to show the step by step recovery of each of component in question (1) above can be separated into its pure form. Clearly label the method of separation at each point of physical separation. More separation arrow may be needed.

Go to http://homework.sdmesa.edu/dgergens/chem100L/exp4/frame_stub8.html (click here)







5. Using your laboratory manual and knowledge obtained from this experiment, define and/or explain these terms:

homogeneous

heterogeneous

sedimentation

decantation

centrifugation

gravity filtration

vacuum filtration

distillation

evaporation

solution

solvent

solute

mixture

pure substance

6. Describe in your own words these types of solutions.

homogeneous solution	heterogeneous solution

7. Word scramble. Find these words.

homogeneous
heterogeneous
sedimentation
decantation
centrifugation
gravity filtration
vacuum filtration
distillation
evaporation
solution
solvent
solute
mixture
pure substance

F I A O C S G X U J F J I U L R A C W V M R
P U R E S U B S T A N C E J W I F G S A I L
D U S L X S E D I M E N T A T I O N C C X Y
I T Q Q M S O L U T E F F A G T I R E U T B
S G J K P F F H O M O G E N E O U S N U U G
T S O L V E N T A E B H H N S N E N T M R H
I B H E T E R O G E N E O U S O O N R F E F
L V A E Q P I N W P A I V V E I C K I I J P
L X T W O I C U Y E T M G P T L Q D F L G Z
A B R N J E U M U A Q S Q U U P H F U T J T
T M H Z I R J C T H X E L D L N Z S G R J Z
I F B U A Q Y N O X X O A X I I B W A A L C
O L V O L U A M D L S M X F J Y D U T T S Y
N K Q N B C J A L R D O W B B H I J I I N R
P N Z Z E E V A P O R A T I O N T I O O P B
O L A D T C W L Z B T C J V K R H J N N K U
I S F G R A V I T Y F I L T R A T I O N U A

(word scramble prepared at http://www.colorstudy.com/scramble/)