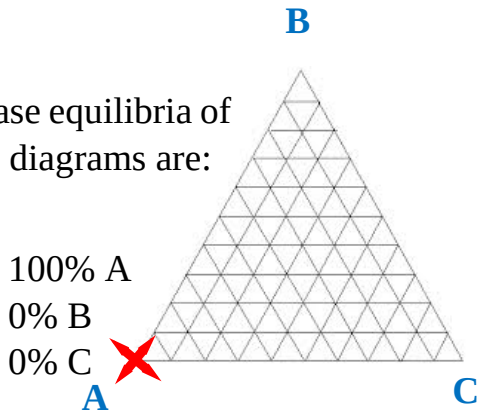
LAB. 2

THREE COMPONENT SYSTEMS

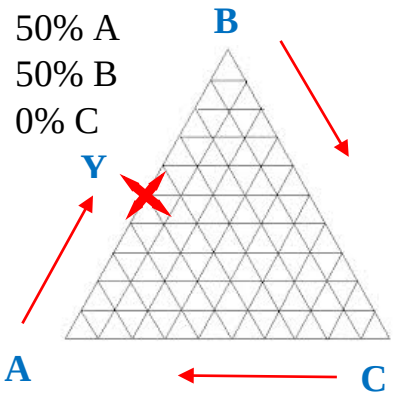
Introduction

, Triangular diagrams are used to illustrate the phase equilibria of 3 component system. The rules relating to these diagrams are:

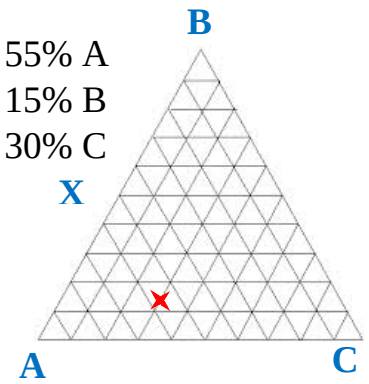
1. Each of the three corners of the triangular represent 100% by weight of one component (e.g. A) and 0% of the other two component (B and C).



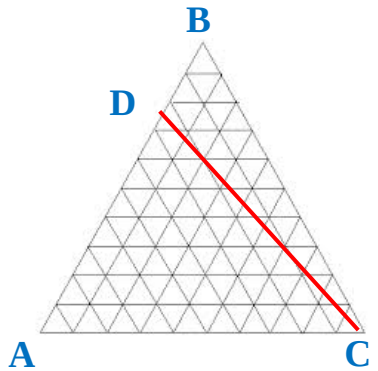
2. The three lines joining the corner points represent 2 component mixtures of the three possible combinations of A, B, and C. For example, point y, midway between A and B on the line AB, represents a system containing 50% of B (and hence 50% of A also, and 0% of C). Each line is divided into one hundred equal units that proceed in one direction (either clockwise or counter-clockwise).



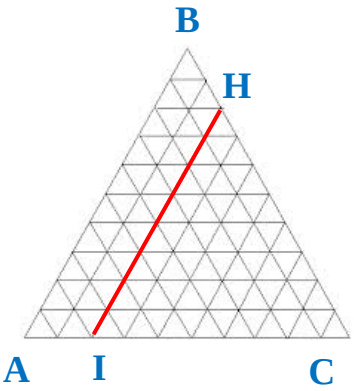
3. The area within the triangle represents all possible combinations of 3 components to give three component systems. For example, the point *x* lies on the line parallel to *AB* that is equivalent to 30% of *C*, and lies on the line parallel to AC that is equivalent to 15% B, and also lies on the line parallel to *BC* that is equivalent to 55% A



4. If a line is drawn through any apex to a point on the opposite side (e.g. line DC) all systems represented by points on such a line have a constant ratio of two components (in this case A and B)



5. Any line drawn parallel to one side of the triangle, (e.g. line HI) represents ternary system in which the proportion (or percent by weight) of one component is constant. In this instance, all systems prepared along HI will contain 20% of C and varying concentrations of A and B



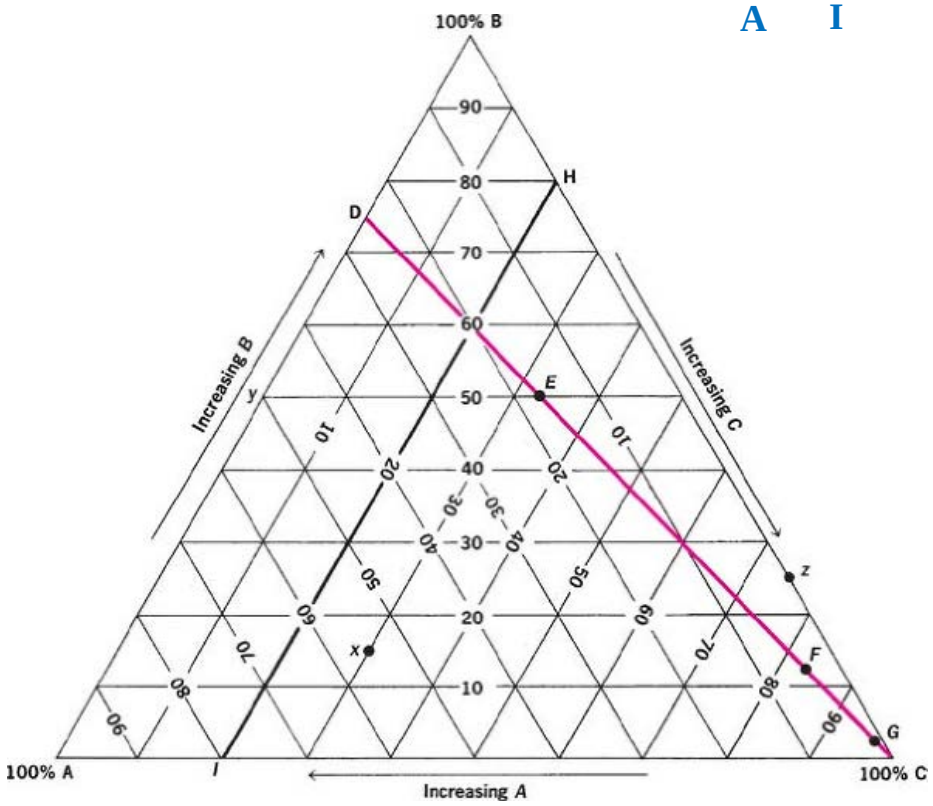


Fig 2-1: The triangular diagram for three-component systems

Materials and equipment

1. Chloroform, acetic acid, and water
2. Conical flasks, burettes, and balance.

Procedure

1. Prepare the following percent w/w acetic acid/chloroform (10 g total) 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, and 90% in small volumetric flasks (All mixtures will form one single phase) (specific gravity of acetic acid = 1.009 and for $CHCl_3$ = 1.3)
2. Add water to these mixtures slowly from a burette until the appearance of turbidity, record the weight of water.
3. Calculate the % w/w of each component in the turbid mixture to obtain a miscibility curve and plot a triangular diagram

Group: Subgroup: Date: ***Lab instructor signature:***

Names:

Results

	Weight of each component (g)			Weight percentage of each component (%w/w)		
Flask No.	**HAc**	**$CHCl_3$**	**H_2O**	**HAc**	**$CHCl_3$**	**H_2O**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Graph