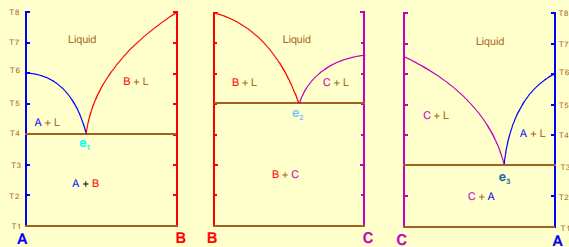


Ternary Phase Diagrams

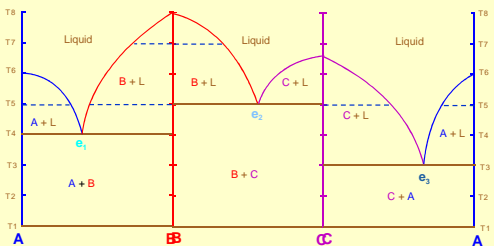
- Three component systems **A**, **B** and **C**
- requires that we know the three binary systems for the 3 components
 - **AB, BC, CA**
- Ternary diagrams present a map of the Liquidus surface which is contoured with respect to Temperature.
- Fields indicated on the ternary diagram represent the primary phase fields present on the Liquidus surface.

Ternary Diagrams - First Step

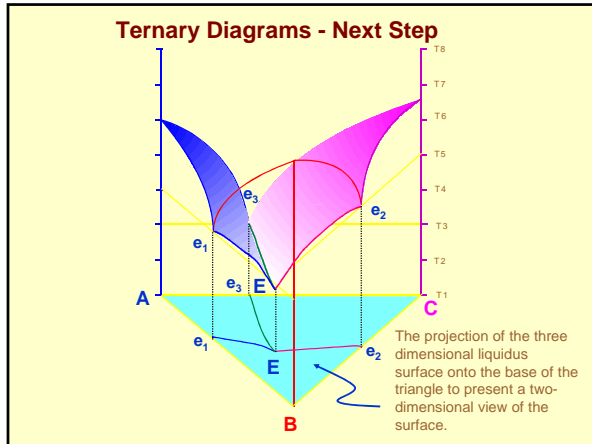


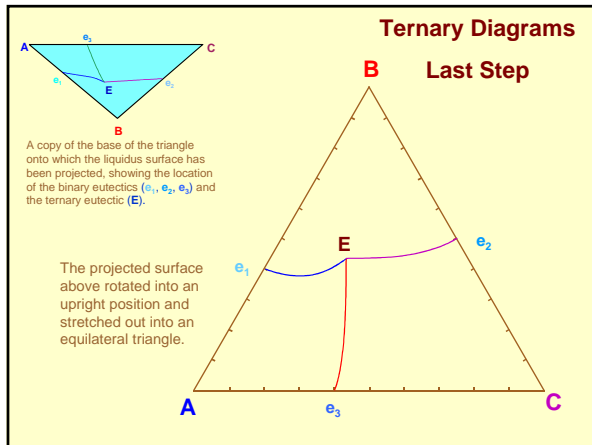
Each Ternary diagram is constructed using the three binary diagrams for the three components **AB, BC** and **CA**

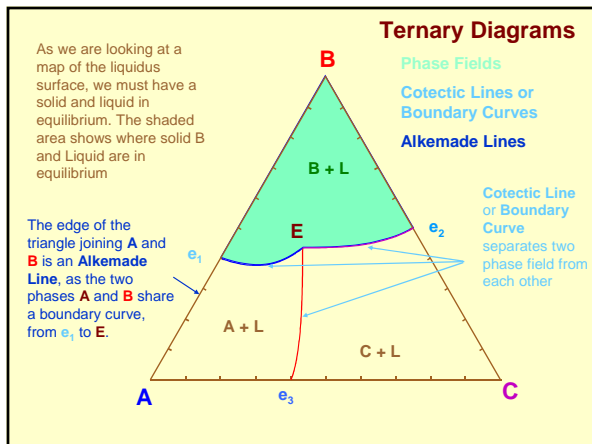
Ternary Diagrams - First Step

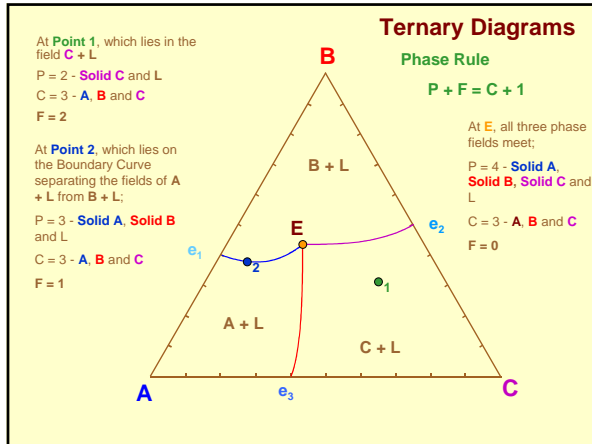


Each Ternary diagram is constructed using the three binary diagrams for the three components **AB, BC** and **CA**



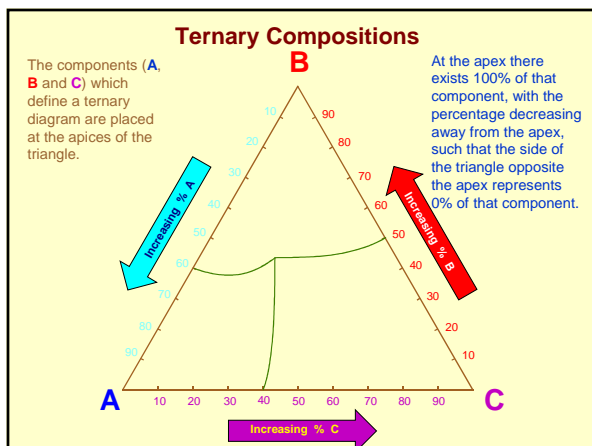






Compositions in Ternary Diagrams

- All compositions e.g. bulk compositions, liquid compositions, solid compositions on ternary diagrams are expressed in terms of the three end-member components which define the system.
- These are located at the apices of the triangle.

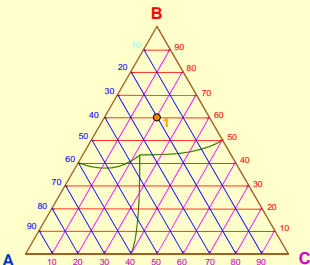


Ternary Compositions

- Compositions of points which lie inside a ternary diagram can be determined by using either of two methods:
 - **Triangular Grid**
 - **Two Line Method**

Triangular Grid Method

- In this method a series of grid lines are constructed.
- The proportion of any point within the triangle can be represented by grid lines drawn through the point of interest, parallel to each side of the triangle.



Composition 1

20% A

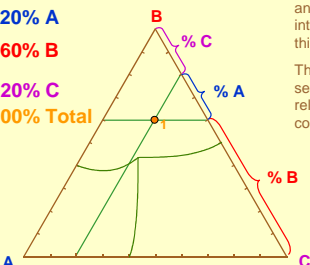
60% B

20% C

100% Total

Two Line Method

In this method two lines are drawn through the composition point of interest, parallel to any two sides of the triangle.



Composition 1

20% A

60% B

20% C

100% Total

The two lines are parallel to the **AB** and **AC** sides of the triangle and intersect along the **BC** side, dividing this side into three line segments.

The lengths of the individual line segments are proportional to the relative amounts of the three components **A**, **B** and **C**.

Ternary Compositions

The two methods used to determine compositions were applied to an equilateral triangle.

However, both methods can be applied to scalene triangles.

To work with scalene triangles the "triangular grid" (Method 1) and the "two lines" (Method 2) must be drawn parallel to the edges of the scalene triangle.

Method 2 - Two Line Method

Method 1 - Triangular Grid Method

Ternary Compositions

Determine the compositions of the points in the following table.

	% A	% B	% C
E			
1			
2			
e ₃			
