

How to complete the Three Polymer design using JMP.

The designs in Chapter 10 have a clear correspondence to the functions in JMP's mixture designer.

Choose Mixture Design Type

Optimal Create a design tailored to meet specific requirements.

Simplex Centroid Run each ingredient without mixing, then mix equal proportions of K ingredients at a time to the specified limit. **K**

Simplex Lattice Triangular grid. Specify number of levels per factor: **N Levels**

Extreme Vertices Find the vertices of the simplex. Then add the mid-points of the edges and averages of vertices to the specified degree. **Degree**

Linear Constraint Add linear constraints on the relative proportions of ingredients. Click once for each constraint.

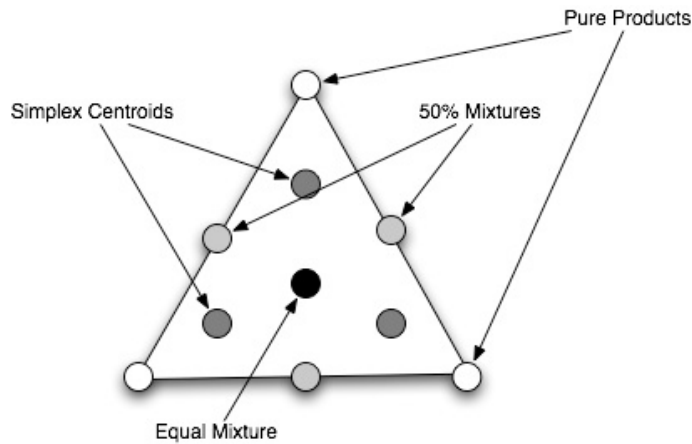
ABCD Design A mixture design for factor screening.

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- Simplex lattice designs are designed using the **Simplex Lattice** button.
- Simplex centroid designs are designed using the **Simplex Centroid** button.

We illustrate the concepts of a mixture design using the example of thread elongation, "The Three Polymers." It uses an Augmented Simplex Centroid design, which contains four different kinds of points:

1. Pure polymers, located graphically at the vertices of an equilateral triangle
2. 50-50 mixtures of the polymers taken two at a time. These points are graphically located at the midpoints of the sides of the triangle.
3. An equal mixture of the three polymers, located graphically at the center of the triangle.
4. Simplex center points, which are located at the midpoints of the lines joining the vertices with the center.



There is no Augmented Simplex Centroid design button in JMP. Which of the remaining choices will generate the desired design?

Since these designs involve four different kinds of points, JMP calls them ABCD designs. The name contains four letters (A, B, C, and D), which reminds you of the four types of points in the design.

If you request an **ABCD Design** for three polymers, the desired design appears. Here we show a Ternary plot of the ten runs.

