This experiment attempted to determine the effects of adding varying amounts of different solutes to water on the melting point of the solution. The response variable was the melting temperature of the solution in degrees Fahrenheit. The first factor was the solute type. Epsom salt (magnesium sulfate), table salt (sodium chloride), and table sugar (sucrose) were the levels for this factor. The second factor was the mole fraction of solute in the solution. One percent, two percent, and three percent were the levels for this factor. A completely randomized design was used for this experiment.

**Means (mplot) Analysis**

The means plot supports the information provided by the stats analysis.

Output:

```r
> mplot(z$Tmelt, z$mol)
```

![Graph of Mean of Y for values of X1 (x axis) and X2 (different line types)](image)
Figure 1 Mean values for melting temperature for each solute type plotted by mole fraction

> mfit(z$Tmelt,z$mol,z$solute)
For more decimals add ,dec=k after variables
Overall Mean of Y variable z$Tmelt = 27.019

Fitted main Effect of Y variable z$Tmelt by X variable z$mol
   N Main.Effect
0.01 9  1.692
0.02 9   0.048
0.03 9 -1.741

Fitted main Effect of Y variable z$Tmelt by X variable z$solute
   N Main.Effect
   Epsom 9   1.703
   Salt 9  -3.175
   Sugar 9  1.470

Table of 2-way Fitted Interaction Effects for z$Tmelt by X variables z$mol and z$solute
   Epsom    Salt    Sugar
0.01 -0.748  2.163  -1.415
0.02   0.063 -0.059  -0.004
0.03   0.685 -2.104   1.419