**The Chemistry of Brownies**

**Let’s see how much nomenclature you remember!**

Some of the basic ingredients in general dessert chemistry are:

Baking Soda
Baking Powder
Eggs
Salt
Sugar
Chocolate

The chemical formula for **baking soda** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and its name is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Chocolate melts because it contains cocoa butter, the fat extracted from the cocoa bean.

Cocoa butter is a complex fat with polymorphic properties. That is to say, cocoa butter is comprised of six different crystal forms that become fluid when exposed to heat. Once chocolate is removed from heat, the crystals in the cocoa butter will "reform," permitting the chocolate to solidify, even at room temperature.

 The roots of polymorphic mean \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Sugar Chemical Name** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ melts, it becomes a clear liquid and breaks down,

forming glucose with the formula \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and fructose with the same

formula. The same formula you say?? How can that be?

Reason: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Baking soda produces carbon dioxide as well as water \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and sodium ions

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ according to the following equation:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The beating of the eggs is usually made to "denature" the proteins that lay within the egg.

Denature? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Since proteins are made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, whenever a

protein is denatured, these bonds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the amino

acid\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Proteins instead are elongated and atoms that were previously bonded between them become available to bond with other molecules.

Which ones do they bond with? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When salt \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ dissolve the salt ion aggregates are "torn apart" by

the water, and are reduced to sodium (Na+) and chlorine (Cl-) ions.

What is the purpose of salt in baking? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_