

Crystallization of Sucrose in Candy-Making Notetaker

Name _____ Food Science

Review of Sucrose:

- Common table sugar = compound of _____ + _____
- One of the most abundant pure organic compounds on earth
- Generally extracted for consumption from _____ or _____

How does Sugar Crystallize?

Sucrose starts out with a _____ structure

****Five factors affect crystal formation:**

1. Type of _____
 - Most often _____
 - Invert sugar (_____ or _____)
2. Use of interfering agents
3. Agitation of sugar syrup
4. Cooling of syrup
5. Ripening of finished product

****Types of Sugar**

Sucrose is the _____ in virtually all candy

- Invert sugar can also be used (naturally found in _____ and _____)

Candy Making

- o Begin by dissolving _____ in _____, creating a _____
- o The solution is then brought to a boil to _____ the water & _____ the solution.
 - Solution is now _____:
 - contains more sucrose molecules than can remain in the solution
 - Excess sucrose _____ spontaneously or around any foreign substance in the solution (such as a particle of dust).

Is crystallization a good thing? Dependent on the type of candy...

1. Crystalline Candies:

- o Require the formation of sucrose
- o Pure crystal candies (_____ candy) **OR** Candies that require _____ crystals
- o Ex. _____
- o Other types of candies may begin with a _____ (sucrose and water solution):

2. Non-Crystalline Candies:

- o Sucrose crystals must be _____
 - o Would produce a _____ texture in the candy and interfere with its _____
 - o Sucrose must be stopped from crystallizing as the syrup is made.
- o Ex: _____

How Do Candy Makers Stop the Sucrose from Crystallizing?

In order to prevent the excess sucrose from recrystallizing **when the solution becomes supersaturated**, candy makers _____...

**INTERFERING AGENTS

- Substances that can _____ crystal growth
- Will _____ to the sucrose molecules, keeping them from binding to each other.

Sugars

- **Most commonly used:** _____
 - High in _____
 - Produce _____ sugar crystals

Fats (_____):

- _____ sugar crystals
- Results in _____
- Also give many candies distinct _____

Acids

- _____ the sucrose in a sugar solution
- Results in _____ levels of _____
- These molecules do _____ crystallize in the same way sucrose does and does not produce sucrose's grainy texture.
- Some acids include: _____

Proteins

- _____ sugar crystals
- Egg _____
- Gelatin: Found in _____

Other Factors Affecting Crystallization

TEMPERATURE

Candy industry revolves around understanding the _____ of sugar to water at given temperatures; related to both & cooling

**AGITATION

_____ of a candy solution

When **HOT**:

Slight or occasional stirring _____

- **MOST FUDGE RECIPES:**
 - Let cool until _____ F
 - Beat vigorously until _____
 - _____ large crystals from forming large clusters (grainy texture)

**COOLING

- Critical to crystal formation and should _____
- Stirring too early can cause crystals to _____
- Crystals formed slowly= _____ texture
Rapid crystallization= _____ texture
- Fondants/taffies often cooled on _____
(results in fast, even cooling)

**RIPENING

- Allowing the candy to sit to form a _____
- Fondant: Requires ripening
- Wrapped securely _____
- Smoother, moister fondant _____ more easily

Candy Temperatures

* Sugar burns are AWFULL! Make sure you are careful and paying attention when making candies.



320 - 360 - Caramelizing Sugars - Caramel Sauces, Flans Parlines - the sugar turns golden brown and begins to break down for a richer flavor

300-310 - Hard Crack Stage - Lollipops, Hard Candy, Brittles - This stage when dropped into cold water will separate into little pieces that will break when bent

270 - 290 - Soft Crack Stage - Taffy, Butterscotch, Candy Apples - This stage when dropped into cold water will be firm but form pliable threads. It will bend before it breaks.

250 - 268 - Hard Ball Stage - Nougat, Marshmallows, Toffees, Gummies, Rock Candy - This stage forms a ball when placed into cold water that holds its shape when removed. However you will still be able to flatten with a little force.

245 - 250 - Firm Ball Stage - Caramels - This stage forms a ball when placed in cold water that will not flatten out quickly when removed but flattens easily when pressed

235 - 245 - Soft Ball Stage - Fudge, Fondant, Pralines - This is will form a very soft ball when dropped in cold water but will flatten quickly when removed

220 - 235 - Thread Stage - makes a syrup not a candy. This stage will form a thin, fine line when drizzled on a plate