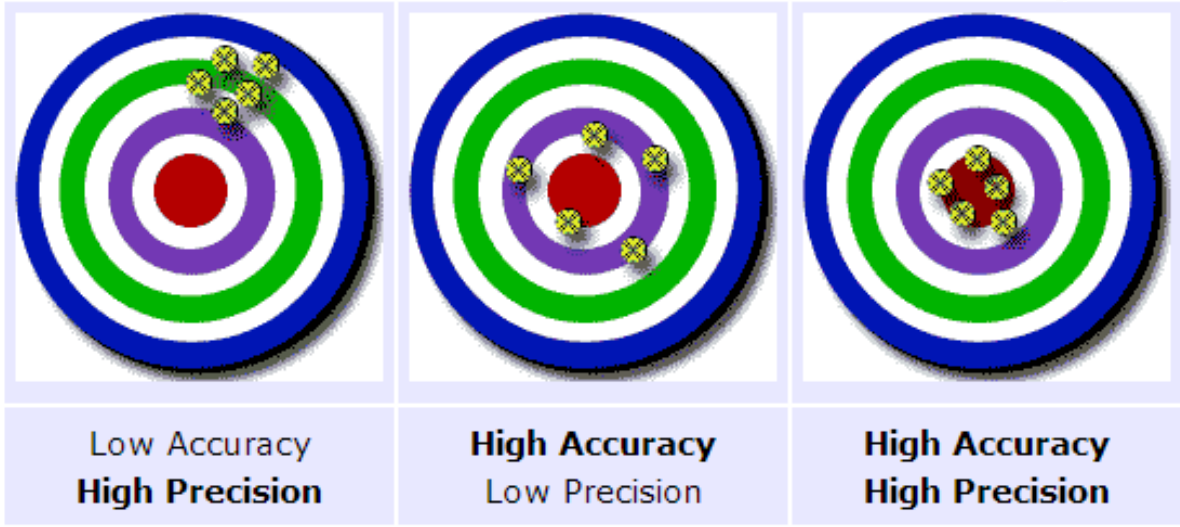
From Last Time:



Low Accuracy **High Precision**	**High Accuracy** Low Precision	**High Accuracy** **High Precision**

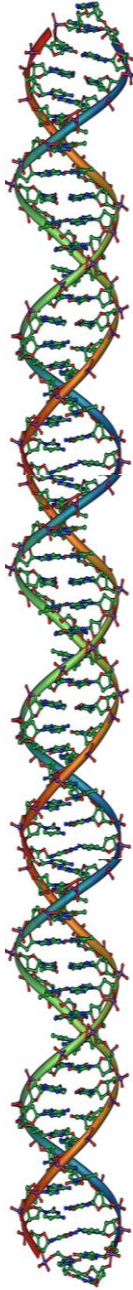
Absolute Scales

Kelvins

- 1K = 1°C
- “Zero” really means “zero”
- 0°C = 273.15K

Rankine (rarely used)

- 1°R = 1°F
- “Zero” is absolute zero
- 0°F = ??°R



Temp!

Scales

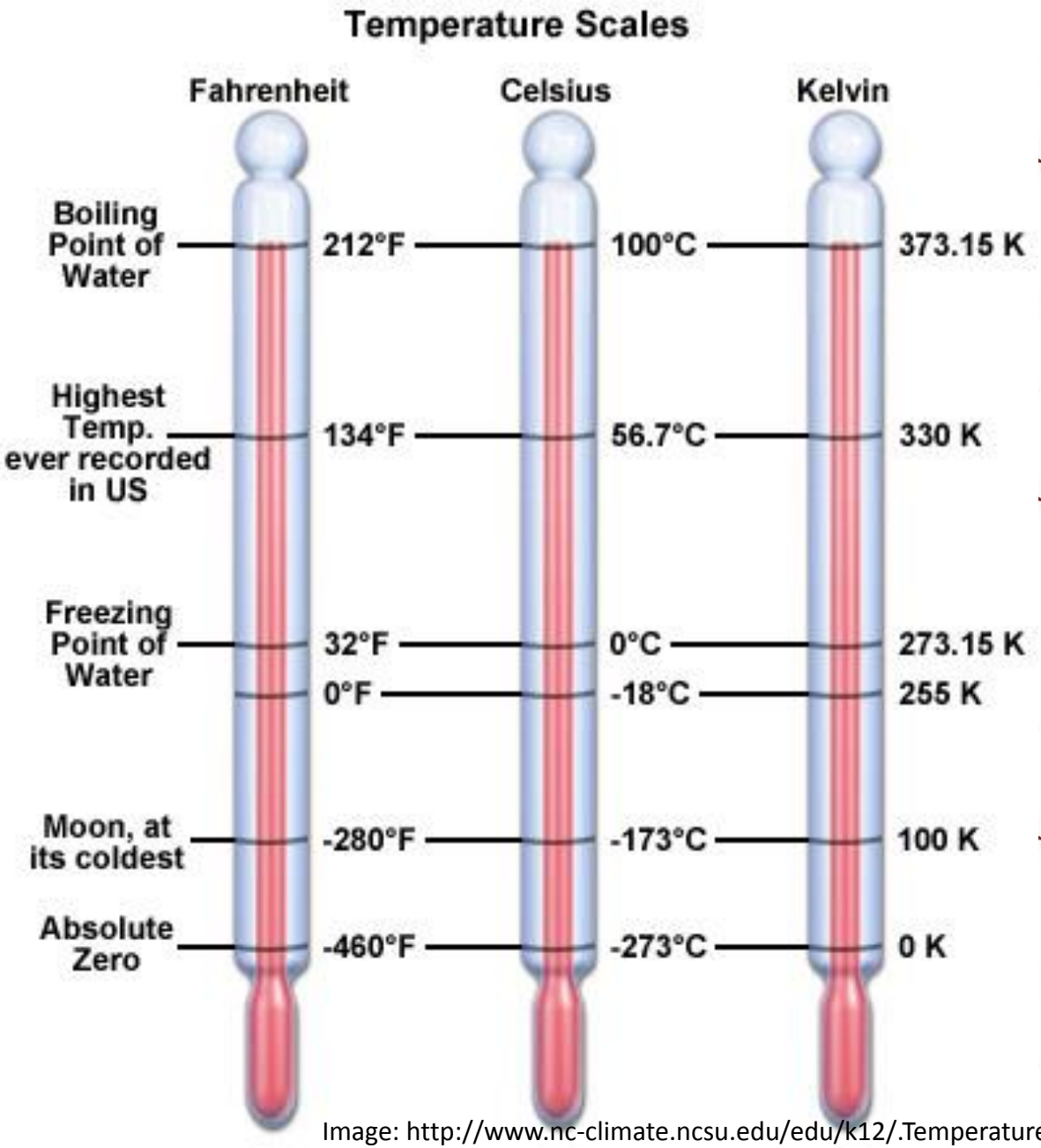


Image: http://www.nc-climate.ncsu.edu/edu/k12/.Temperature

Heat Management

Specific Heat Capacity –

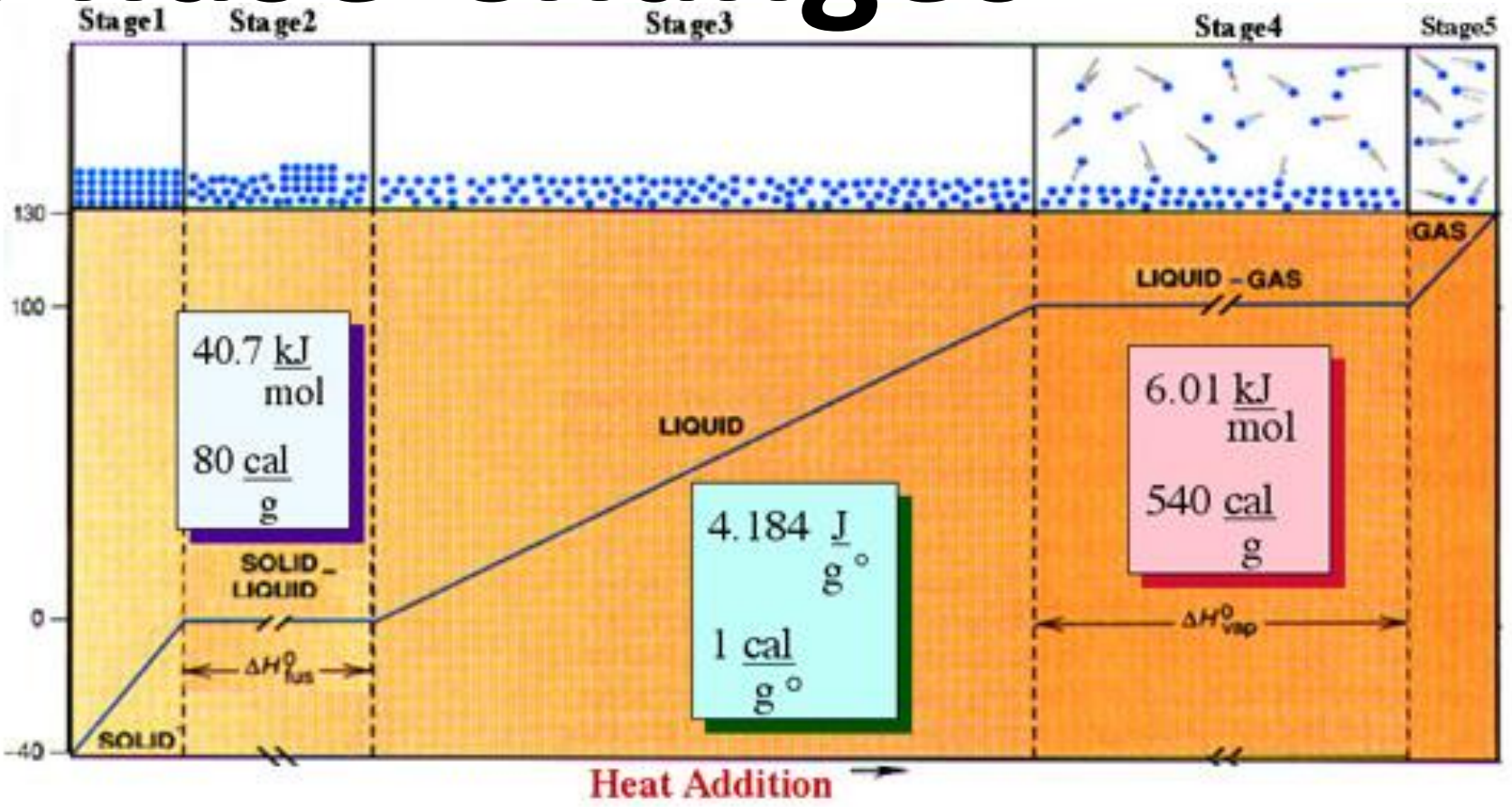
the amount of heat energy required to raise the temperature of 1 gram of a substance 1°C.

For water, 1 calorie per gram °C

"Dietary Calorie" vs. calorie

http://www.engineeringtoolbox.com/specific-heat-capacity-food-d_295.html

Phase Changes

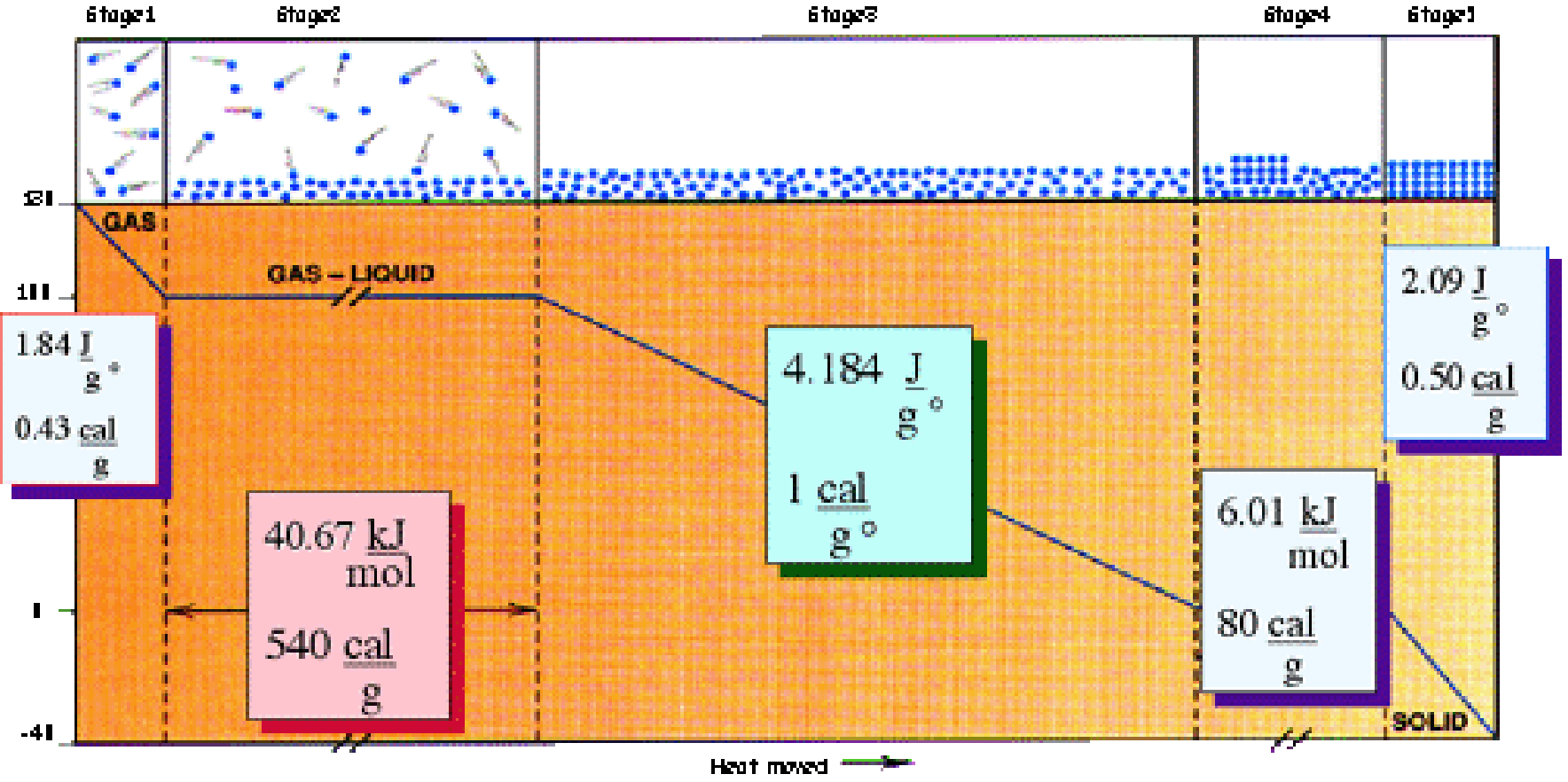


What is the energy needed to take 1g H_2O at 0°C to 100°C ?

80 +100+ 540 =720cal

Image: http://faculty.sdmiramar.edu/fgarces/zCourse/All_Year/Ch100_OL/aMy_FileLec/04OL_LecNotes_Ch100/02_EnergyStateMatter/203_StMatter/203_StMatterIMF.htm

Phase Changes



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Egg Whites – Whip It!

Foams – Meringue (albumin only)

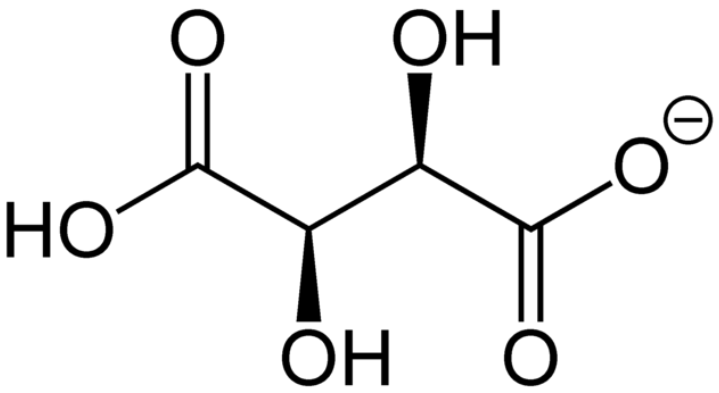
- Review micelles – water/air interface
- Similar in concept to whipped cream or yogurt curdling
- Mechanical shearing of protein bundles
- Soft foam – water lubricates bubbles
- Hard/Stiff/Dry peaks – protein bubble walls squeeze out excess moisture

Cream of Tartar

Potassium tartrate – adds acid

Prevents disulfide bond formation

Proteins need to interact, but not TOO strongly



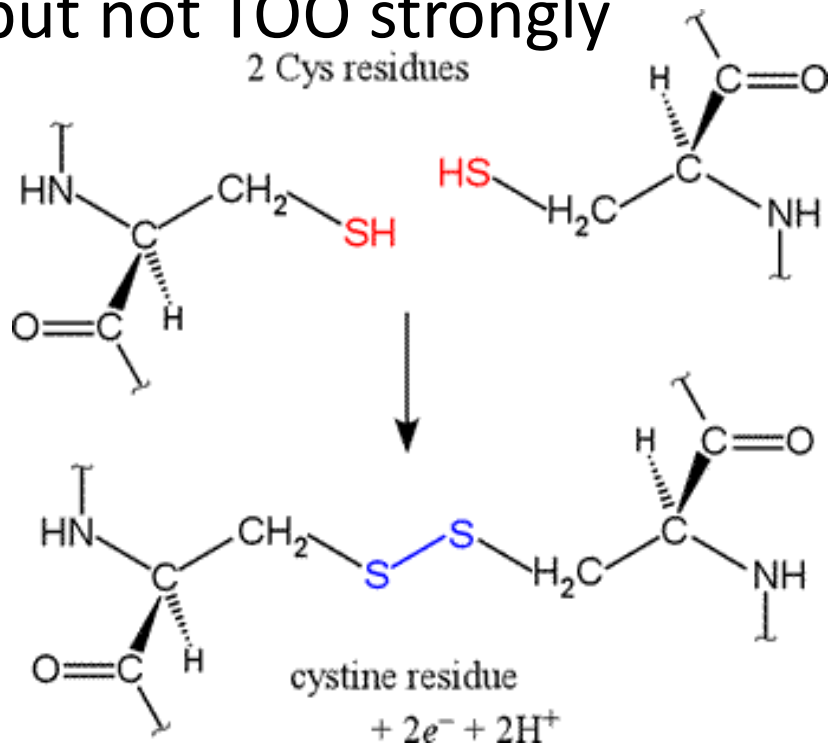
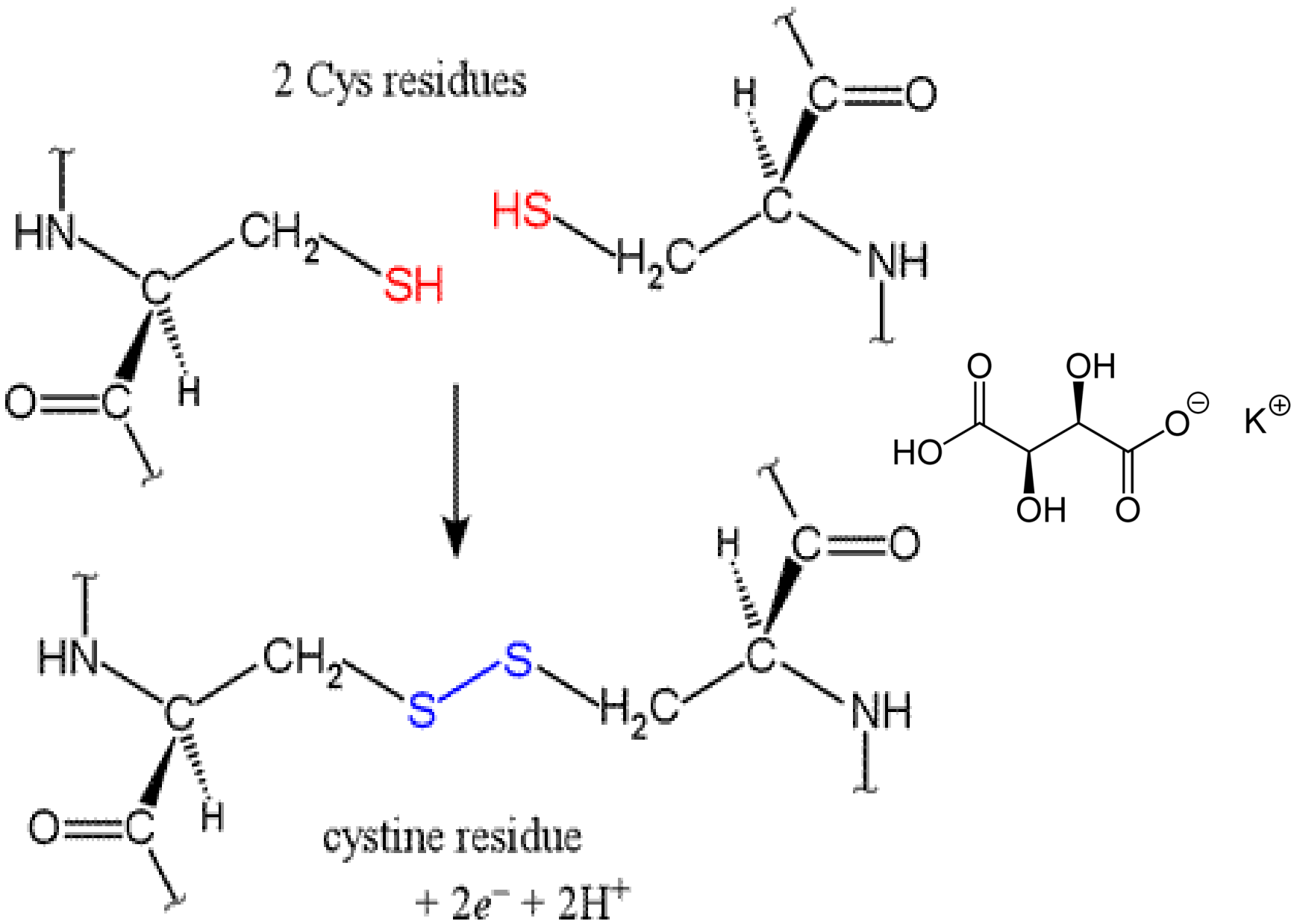


Image: http://en.wikipedia.org/wiki/File:Weinstein_Strukturformel.png

Image: http://guweb2.gonzaga.edu/faculty/cronk/biochem/D-index.cfm?definition=disulfide_bond



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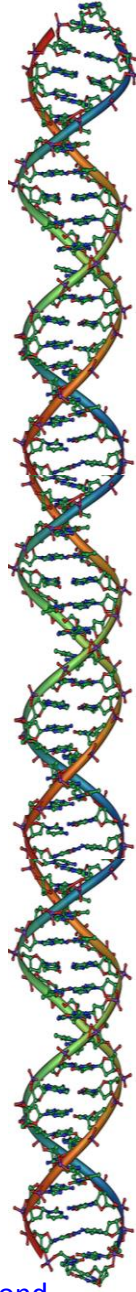
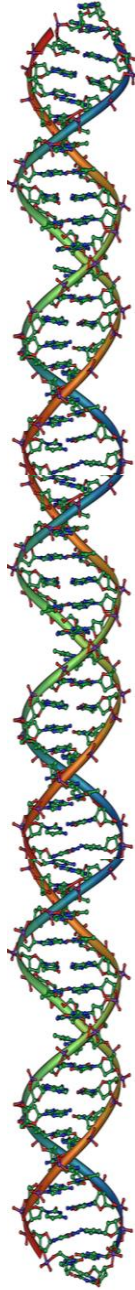


Image: http://guweb2.gonzaga.edu/faculty/cronk/biochem/D-index.cfm?definition=disulfide_bond

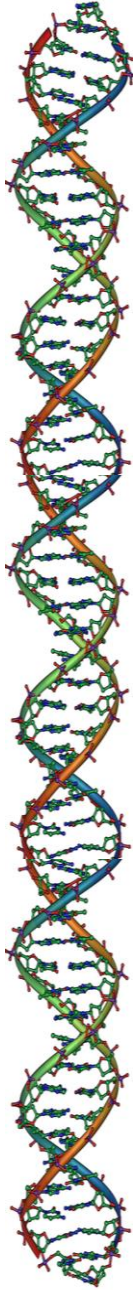
Setting White Foams

- Heating dehydrates
- Ovalbumin denatures at higher T
  - Secondary network, reinforces
- Role of sugar
  - Strengthens “cages” with sugar strands
  - Delays dehydration (ovalbumin denature)



Whipped yolks

- Fat prevents foam
  - A little yolk ruins a meringue
- Air bubbles lighten color
- Low “free” water content
- The beginnings of a custard
  - Network of egg proteins
  - Suspends milk fat

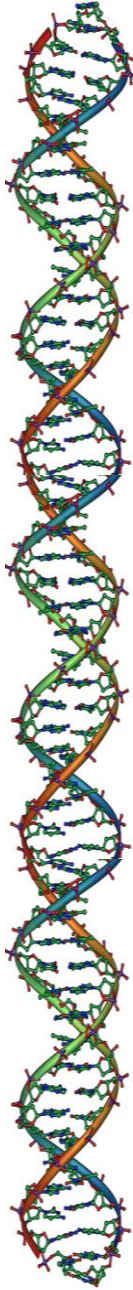


Whipped Whole Eggs

Not as fluffy as whites

Not as silky as yolks

Will they foam?



Cooking Eggs

Balance of fat, protein, water, air

- Water – high heat capacity
- Fat – solidifies, liquifies, separates
- Protein – denatures or not?
- Air – excellent insulator {Why?}