

A Chemist's Brownie Recipe

Uh oh! I (Mrs. Walsh) was trying to convert an American brownie recipe into metric units for my sister-in-law in Ireland, and I was in a hurry and the recipe doesn't make sense! Some units are in grams, some are in moles, and some are missing! Help me finish the recipe below.

1. Go into the lab and take measurements (in grams) for ingredients that only have American measurements
2. All good chemists make sure the data table is completely filled out. Perform any necessary calculations to finish the ingredients table.



Table 1. Ingredients and required measurements

Ingredient	American recipe amount	Chemist's recipe amount	
Butter	$\frac{1}{2}$ C	145 grams	n/a
Granulated Sugar (C₁₂H₂₂O₁₁)	1 C		0.58 mol
Eggs	2	2	n/a
Vanilla (mostly ethanol) (C₂H₅OH)	1 tsp		0.091 mol
Unsweetened Cocoa	$\frac{1}{3}$ C	80 grams	n/a
Flour	$\frac{1}{2}$ C	65 grams	n/a
Baking Powder (NaHCO₃)	$\frac{1}{4}$ Tsp		
Salt (NaCl)	$\frac{1}{4}$ tsp		
Nuts (optional)	$\frac{2}{3}$ C	75 grams	n/a
Aluminum Foil (Al)	Enough to cover dish		

Directions

1. Preheat the oven to 175 °C (350 °F). Grease and flour a square pan.
2. Melt butter in a large saucepan. Remove from heat, and stir in sugar, eggs, and vanilla. Beat in cocoa, flour, salt, and baking powder. Spread batter into prepared pan.
3. Bake in the preheated oven until top is dry and edges have started to pull away from the sides of the pan, about 25 to 30 minutes.