

Make your own Soda - - Cheap!

by [juggler](#) on April 16, 2007

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Intro: Make your own Soda - - Cheap!

So I like carbonated beverages. Soda, Beer (especially beer), Champagne, whatever bubbly. So I found this Lindsay Press deal about how to make your own soda.

<http://www.lindsaybks.com/prod/index.html>

There are three options

1. Spend a lot of money and buy a commercial soda fountain or it's parts. Expect to pay at least \$200 even on ebay for a carbonator unit (a pump and a chamber probably without regulators)
2. Ferment. Take sugar water, add yeast and wait. This is definitely the lowest cost solution, but I don't like to wait.
3. Follow the instructions that follow
4. OK There is a fourth option: Buy the premade stuff (but hey, this is "instructables" right? We like to Do it ourselves.

So Stuff you will need: CO2 canister - If you can't afford one (or don't drink enough beer to have a kegerator) then troll the streets. Restaurants often leave these out in back to be exchanged with new ones. Choose a large chain restaurant to steal from. No, don't steal. CO2 is useful for other projects. Buy a cylinder. They last a long time (essentially forever) You will need to buy a regulator. \$40. buy a new one.



Image Notes

1. about 50 PSI on outbound CO2



Image Notes

1. regular quick release air coupling
2. Shut-off Valve
3. Steel plates and wing nuts



Image Notes

1. this is the u-shape. Cut it to fit your plastic bottles. The distance across the opening should be just slightly over 1 inch.
2. 1/4" carriage bolts



Image Notes
1. Quick release coupling
2. convenience valve
3. nipple



Image Notes
1. Here is where the CO2 will enter your bottle. Make it line up over the U-shape.

step 1: Gather Materials

I chose this method since I had a CO2 cylinder, regulators, hoses, fittings and whatnot already in my possession. If you don't have stuff like that, then fear not. The total cost will still be less than that of the in-line carbonator devices.

So gather your materials:

*Plastic 2-liter bottles - they must have that ring below the neck

- There are 2 neck sizes , and I have built this for the smaller, more common size.
- Metal plate - about one square foot should be plenty. Stainless steel is probably ideal. I used plain old mild steel, and aluminum could work if it's thick enough not to bend easily.
- Pipe Fittings - I'm using 1/4" pipe fittings
- short nipple (i used brass)
- valve (also brass)
- quick disconnect air fittings (2 male, 2 female) and some air hose
- teflon tape
- CO2 cylinder (you can get a very small one which will last a good long time at a beer brewing supply store, or a welding supply store)
- CO2 regulators (also available at brewing supply store or welding supply store)
- wing nuts and carriage bolts (1/4" are good) about 2 inches long.
- some kind of gasket material. -- silicon aquarium sealant is probably best, but I have used bike innertube successfully



Image Notes

1. about 50 PSI on outbound CO2

step 2: Metalwork - make the plates

First measure and cut two plates of your metal.

Mine are about 1.5 inches by 3 inches.

Notice the image below. You are planning to make the bottom plate with a slot in it to fit around the neck of the plastic bottle below the "shoulder", and the bolts will run up through both plates to secure the top plate against the opening in the top of the neck. The top plate will have the hole for the CO2 to be delivered into the container full of cold water.

Before you get started, put the container filled with water into the refrigerator.

Then cut your plates.

measure for the u-shaped cut out.

The neck of the plastic bottles is almost exactly one inch, so my plate is cut out to about 1 1/8 inch, which is a bit large, but still works.

So then cut the u-shape however you can. I used a cutting torch to do mine. You can use a hole-saw perhaps to start then a hack saw to finish, or perhaps you use a jig-saw or recip-saw. Whatever you have.

Next you need to drill the holes for the clamping bolts. Stack the plates, and drill both plates at once. This way your holes will be sure to line up even if they are not perfectly spaced.

Last, drill and tap the hole for your CO2 fittings. Mine are 1/4" Pipe.



Image Notes

- 1. regular quick release air coupling
- 2. Shut-off Valve
- 3. Steel plates and wing nuts



Image Notes

- 1. this is the u-shape. Cut it to fit your plastic bottles. The distance across the opening should be just slightly over 1 inch.
- 2. 1/4" carriage bolts



Image Notes

- 1. Here is where the CO2 will enter your bottle. Make it line up over the U-shape.

step 3: Assemble Fittings

You now are ready to assemble the fittings.

The CO2 will enter the assembly through a quick-release air coupling. These are commonly used in workshops for air tools, blow guns, and tire fillers. I added a valve so that I could detach the supply without blasting out all of the gas. It is a nice feature but not required.

See the picture, it's pretty obvious.



Image Notes

- 1. Quick release coupling
- 2. convenience valve
- 3. nipple

step 4: add a gasket to the plate

in order for the gasses to stay in the bottle during carbonation, you'll want a gasket.

- I tried
- automotive RTV gasket maker
- 100% silicon sealer (caulk)
- glued-on bike inner tube

the bike inner tube works the best. It's not pretty.

It imparts no flavor to the product, and if you have a more food-grade gasket, that would probably be better.

I contemplated cutting up my wife's silpat cookie sheet, but I like being married.



step 5: Make soda

so now you are ready to make it.

Get your bottle of water from the fridge.

Open the cap

Attach the assembly and screw the clamping screws on tight. Just tight, not overly tight.

close the valve

attach the CO2 line

open the tank valve

adjust the pressure on the regulator to about 50 PSI

open the valve on the bottle.

Check for leaks, and hisses.

Shake the bottle for about 30 seconds to a minute (more shaking == more fizz)

close valve on bottle.

Disconnect quick-release

close CO2 tank valve.

open bottle valve slowly

[http://www.instructables.com/id/Make-your-own-Soda-----Cheap/!](http://www.instructables.com/id/Make-your-own-Soda-----Cheap/)

remove assembly
enjoy bubbles.



Image Notes

1. See, it fits around the neck - below that lip



Image Notes

1. about 50 PSI on outbound CO2

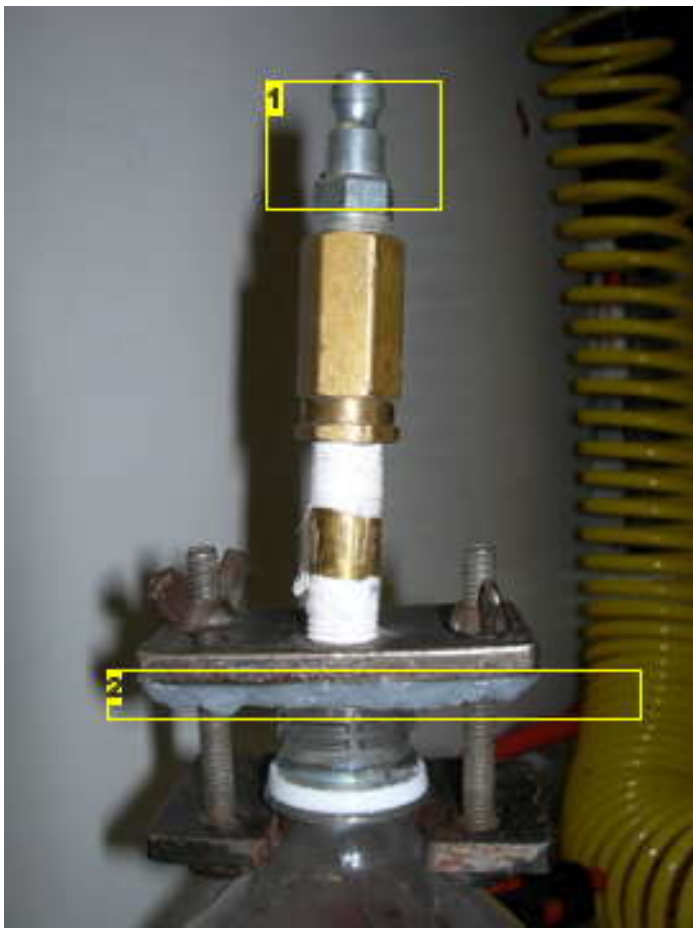


Image Notes

- 1. this is the quick release coupling
- 2. failed silicon gasket :(

Related Instructables



Ziplock CO2 Grenade by pyro22



CO2 Generator by degroof



Carbonating: The Cheap and Easy Way by egreen767



Soda Can Trick by The Mollusk



1\$ Popcorn Machine by loup226



Home Carbonation System...Cheap, Healthy, and Green. by letsapocalypso



Brooklyn Egg Cream - Drink by caitlinsdad



Flat Soda? Not anymore! (video) by Howie_D

Comments

50 comments [Add Comment](#)

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loqk says:

By the way, I notice a lot of people seem to carbonate warm liquids.

It is known that gasses (non polar) dissolve more readily in cold water and salts (polar) dissolve more readily in warm water.

So for maximum absorption of CO2, make sure your drink is ice cold before adding CO2

Dec 7, 2008. 5:14 AM [REPLY](#)



nanonot says:

Can i use any kind of tubing from the CO2 tank to the bottle?

Sep 30, 2008. 4:57 PM [REPLY](#)



tradergordo says:

The method in this instructable:

<http://www.instructables.com/id/DIY-Soda-Water-%26-Home-Carbonation---Pays-For-Itself/>
Is better, easier, and cheaper.

Dec 22, 2007. 7:22 PM [REPLY](#)



juggler says:

Well, I don't know how you are qualifying "better, easier, and cheaper" because it is exactly the same method except for where you connect to the water bottle...
whatever.

Dec 24, 2007. 11:19 AM [REPLY](#)



tradergordo says:

Sorry, was just putting the comment there for someone that might be looking to do home carbonation so they knew there was easier ways. I don't know why people make this more complicated than they have to. Heck even the other instructable makes it more complicated than it has to be. Just stick a 1/4 inch barb onto your regulator if it doesn't already have one, attach a tube, and stick a 99 cent tire inflater on the end of the tube. Then stick a cheap schrader valve in a plastic soda bottle cap and you are done. You can carbonate any liquid in about 5 seconds. Better, easier, cheaper, faster, whatever...

Dec 24, 2007. 1:39 PM [REPLY](#)



Jwoody69 says:

I noticed in the original article that a kegerator is referenced but I have also noticed that soda regulators have pressures of 160 PSI but beer regulators only go to 60 PSI. I have found really nice beer regulators at some of the lowest prices at www.kegcowboy.com but they only sell beer regulators and beer kegerator equipment. Is it enough for soda too?

Sep 11, 2008. 8:36 PM [REPLY](#)



tradergordo says:

60 is plenty. A two liter soda bottle is supposed to be able to handle up to 200 psi but in testing they can burst around 140 psi. Of course in the real world you don't want to get anywhere near their burst point. Most people do not like having more than 30 psi carbonation for their soda, and commercial soda products never exceed 30. Its actually hard to drink (and annoying) at much higher levels of carbonation (you'll be burping continuously).

Sep 12, 2008. 7:16 AM [REPLY](#)



Jwoody69 says:

hmmmm maybe I do need a soda regulator so I can make some special 120 psi soda for my mother-in-law and sit back and watch the show.....

Sep 12, 2008. 8:22 AM [REPLY](#)



BuilderboY says:

haha, is that that one effect in photo booth?

Jul 9, 2007. 7:27 PM [REPLY](#)



Oompa-Loompa says:

ya i saw that on my mom's new laptop.

Jul 31, 2008. 10:40 AM [REPLY](#)



dave48858 says:

perfectly safe as far as the bottle holding up, I put 180 pounds on my setup (20 oz, 1l, 2l, & 3l bottles). your contraption for the top, I'm not too sure about. when I made mine, I just used a valve stem, took the valve out, drilled a small hole through the cap, attached the valve stem there, 1/4 in hose to a couple ball valves and it worked fine, much cleaner and quicker.


Jul 30, 2008. 12:29 PM [REPLY](#)


also turning the bottle upside down in introducing the co2 made it carbonate much quicker.


best of luck, Dave

 **Matt D655** says: Jul 19, 2008. 8:57 AM [REPLY](#)
you should use a mix of 70% nitrogen and 30% Co2
for crbonation, co2 is ok but nitrogen is better.


 **sneigke** says: Jul 21, 2008. 4:56 PM [REPLY](#)
Oh, and it's the CO2 which actually carbonates, not the nitrogen...

 **sneigke** says: Jul 21, 2008. 4:55 PM [REPLY](#)
For Guinness, yes... Soda... NO!
The N gives Guinness beer that heavy, lingering, cool looking head. I don't think I'd want that in my rootbeer!


 **Wired_24_7** says: Jun 23, 2008. 7:32 PM [REPLY](#)
wow... that video looks pretty dangerous! Not sure if I would try that without protective gear, you have a little bottle rocket in your hands.

 **casper.707** says: Feb 23, 2008. 11:34 AM [REPLY](#)
I are ben, you are cheap! A pack of napkins is only like two dollars at wally world


 **i are ben** says: Feb 29, 2008. 5:33 PM [REPLY](#)
what is a good brand of napkin then?


 **Rishnai** says: May 26, 2008. 10:33 PM [REPLY](#)
The kind that doesn't look like truckstop toilet paper--a.k.a. 40-grit, translucent, and won't absorb anything. If it looks fluffy, it's probably a good napkin. Get six dollars together and buy three brands if you're not sure.

 **i are ben** says: Feb 10, 2008. 12:31 PM [REPLY](#)
Were can I purchase a napkin without buying a whole pack?

 **James (pseudo-geek)** says: Apr 1, 2008. 7:16 PM [REPLY](#)
HHAAAAAAAAAAAA try wendy's, McDonalds, or any other fast food resteraunt, they give them out free.

 **ValdezB** says: Jan 17, 2008. 10:53 AM [REPLY](#)
Your laundry dryer sounds great :)

 **cprmichael** says: Dec 26, 2007. 6:48 PM [REPLY](#)
Two quick comments.
1) Keep in mind while shaking that even though it's a closed pressurized system, gravity is still in effect and if you shake the bottle higher than the regulator, the "water" will tend to run down the tube and into the regulator where it (conceivably) could mold and contaminate the next batch. I learned this the hard way, carbonating home brew.
2) Keep an eye on the regulator pressure and resist the temptation to crank the pressure way up for a quick carbonation. I don't know the bursting pressure of a PET bottle but when they go, they tend to explode big time.

 **davidlaska** says: Jul 5, 2007. 1:24 PM [REPLY](#)
I have these parts:
1 - A navy **CO2 extinguisher** , looks and feels like older diving heavy air tanks
2 - An empty **water extinguisher** with a build in pressure gauge and tire valve and rated refillable. (big silver stainless steel ones that spray water under air pressure)
3 - A few new high pressure propane hoses with air valves for filling tire.
4 - An access to brass fittings for conversion and etc.
Can I put a tire air filler on the CO2 bottle and Carbonate water in the water silver container and shake it after the pressure gauge reach 100 psi, (recommend refill pressure)?
The key concern is skipping the regulator. Larger canisters seems to reach over-pressure limits at a slower safe speed while watching the pressure gauge
It is not safe as a routine without a regulator but maybe monthly with a clear head and cold CO2 tank?
I do not have money to go shopping and I am dying for carbonation. That would be a luxury.



juggler says:

Jul 5, 2007. 5:56 PM [REPLY](#)

I would definitely worry about the purity of the co2 in a fire extinguisher. I have never used or played with one so I don't know if they add any other chemicals. It seems like they might.
If you are having it filled, then you could make sure it holds only pure co2.
Otherwise, the only thing to worry about is over pressurizing the water extinguisher if you don't have regulation.
Probably be worth a try, though. If you're careful, you should be able to stop filling the water extinguisher in time to not over do it...



kamu11 says:

Nov 19, 2007. 1:16 PM [REPLY](#)

You do not add any chemicals or anything at all to a fire extinguisher filled with co2. The co2 for fires and carbonation are exactly the same



davidlaska says:

Jul 28, 2007. 11:40 PM [REPLY](#)

I found some information about people buying old CO2 extinguishers and using them up and changing the valve of the bottle. My project worked, but I never did get the it as bubbly stating as soft drinks.



davidlaska says:

Jul 6, 2007. 11:59 AM [REPLY](#)

I did it and I liked seeing it done in person. I did remove the stop in the tire filler so the CO2 canisters hose would not blow (since it was designed to direct co2 out. But the water extinguisher is leaky and now I am worried about what the Navy added to the their extinguishes 40 years ago.



LasVegas says:

Apr 23, 2007. 4:46 PM [REPLY](#)

Great Instructable. I have to say, I was a bit disappointed. The first picture was that of a modified refrigerator, much like what my dad had done. Instead, it was a cool way of processing a 2 liter bottle. Good idea, but the 1st picture doesn't show it. I suggest adding a picture of a class a iced charged (soda) water with a slice of lemon or lime as the intro picture.

I've been wanting to repeat my dad's process for years. I even bought an old refrigerator for that purpose. It's been sitting on my back porch for about 10 years now... I think I'll need a new one.



juggler says:

Apr 27, 2007. 5:00 PM [REPLY](#)

I have made soda water in soda kegs before, but only use my kegerator for beer...
Perhaps I should post instructable on making a kegerator?
It is really just drilling holes in the fridge, though.



squeakpickle says:

Sep 27, 2007. 6:43 PM [REPLY](#)

Augh! I was swearing to a friend that I would be able to find an instructable for a kegerator, and your mention is the closest thing on the site. So, pretty please, post a kegerator instructable, or I may never be able to face my again.



Punkguyta says:

Apr 27, 2007. 2:10 PM [REPLY](#)

You mean you run the pop through the compressor? That can't be good seeing as you probably wouldn't be able to get all the freon out?



LasVegas says:

Apr 27, 2007. 3:26 PM [REPLY](#)

Absolutely not! The fridge is simply used as a cooling device. The CO2 tank is kept outside and lines are run into the refrigerator to charge two cans of water. Another line from the cans is fed out of the refrigerator to the tap (replaced the rinse attachment on the kitchen sink).



Punkguyta says:

Apr 28, 2007. 1:39 AM [REPLY](#)

Oh, I was going to say there for a moment "what the fuck?". I get it now though, sorry about that.



chickenliver123 says:

Aug 21, 2007. 12:06 PM [REPLY](#)

not cheap... expensive



letsapocalypso says:


Jul 25, 2007. 3:45 PM [REPLY](#)

Looks interesting...I've come up with my own instructable with a different method (using a tire chuck and valve)...check it out, and let me know what you think!


<http://www.instructables.com/id/EKWAN4FF44XY58J/>


Last month, I happened across an incredibly detailed essay on carbonation by Richard Kinch, without which I could not have completed my project...I highly suggest reading over his opus before embarking on your own carbonation exploration.


<http://www.truetex.com/carbonation.htm>


 **xeroxmop1** says: May 31, 2007. 9:49 PM [REPLY](#)
This is really neat.
I just scored a free CO2 tank from my work and I'm trying to find a place that sells "the carbonator", a regulator and will give me a CO2 fill so I can get the errand done in one fell sweep! Is it me or is the carbonator one expensive 16 dollar piece of plastic?...


lemme know!
thanks


 **Scurge** says: Apr 30, 2007. 2:16 PM [REPLY](#)
definitely cool! gives me an idea..... anyone know the bursting pressure for those bottles off hand?


 **juggler** says: Apr 30, 2007. 5:28 PM [REPLY](#)
Looks like someone in wikipedia thinks around 200PSI, but I recall it being higher than that from a mythbuster's episode ...
http://en.wikipedia.org/wiki/Dry_ice_bomb
What's your idea, if you can share?


 **Scurge** says: May 1, 2007. 9:51 AM [REPLY](#)
i havn't done an instructable yet so i was gonna do one on it. i just gotta build it first (i'm in the process of movin, so....)

 **the_joat** says: Apr 29, 2007. 5:49 AM [REPLY](#)
If you already have a kegging system with ball-lock connectors (that's the kind of connector on a Coca Cola style Cornelius keg), you can get a plastic top for plastic soda bottles called The Carbonator for about \$10 or so. It's a male ball-lock connector with screw threads that fit standard soda bottles. All you have to do is connect your CO2 line to the bottle and shake. That's what I did, and it didn't require any fabrication at all. An even cheaper method is to put a regular air chuck on the CO2 line. Then all you have to do is drill a hole in your bottle's cap and attach a metal tire valve. Those valves only cost a couple of bucks.


 **juggler** says: Apr 30, 2007. 5:30 PM [REPLY](#)
Now that two comments have pointed to that much cheaper solution, I must confess that I built this device probably 5 years ago, and I was not aware of this screw-top carbonator at the time. Indeed, I did this because I had literally ALL of the parts on hand.
So it goes.


 **schlammbad** says: Apr 29, 2007. 6:54 PM [REPLY](#)
After seeing a picture of the Soda Club carbonator, I noticed they have a tube that releases the CO2 several inches under the water surface instead of just exposing the top to CO2. I wonder if your device could be modified to include this and thus shaking isn't necessary at all.

 **papa-g** says: Apr 21, 2007. 6:51 PM [REPLY](#)
Hey Juggler, can this be modified to work as the fluid passes through a hose (kinda like in a fountain)? That would be ideal, as I am lazy and don't feel like shaking each bottle for fizzzz.

 **supercrisp** says: Apr 24, 2007. 6:46 AM [REPLY](#)
Hey, try hooking the bottle up while it's in an agitator for color film processing. There are several types. The most common is a rotating unit that rotates through 450 degrees. You can also find rocker types, but they are rare. It would also be easy to build a rocker type agitator yourself using a rotating cam and a small, slow motor, like a stepper motor used in poncet mounts for dobsonian telescopes.
My partner is a European and thinks water that doesn't bubble is unfit for consumption. I might try making my own seltzer.....

 **Punkguyta** says: Apr 27, 2007. 2:08 PM [REPLY](#)
Interesting theory at the bottom there.

 **trebuchet03** says: Apr 21, 2007. 7:45 PM [REPLY](#)
If you're lazy -- just leave the bottle attached for a couple hours ;) Shaking just helps the CO2 get into solution. But if you don't shake, it just takes longer ;) At least, it should follow the same rules as forced carbonation of homebrew beer :)

 **juggler** says: Apr 22, 2007. 12:18 AM [REPLY](#)
So the best way is to
1. refrigerate the water
[bringing it to a cooler temperature allows the co2 to better go into solution]
2. attach and shake [forcing the co2 into solution]
If you just connect the co2 and wait, you definitely need to have the water be refrigerated while it is under pressure. Also the pressure should be closer to 60 or 70 PSI if you don't shake it. Additionally if you do not shake the solution, you will not achieve the same level of carbonation.
Beer is carbonated via fermentation. Even commercial beer is carbonated this way.

If you are really lazy, just buy soda. If you want to do it yourself, you are not lazy. Just cheap. And maybe you don't like sugar. Or wasting the resources to make bottles.

The best way to go is get a soda keg and carbonate about 5 gallons at a time. You then need to keep it under pressure to dispense it.

This is the "batch" method. The "on demand" method is what I described in the introduction using the "carbonator unit" which is essentially a tank under CO₂ pressure through which you force the water under greater pressure. That way you get seltzer on demand instead of in batches :)



lemonie says:

Apr 23, 2007. 1:00 PM [REPLY](#)

W/ref beer:

I sat through a lecture from a guy who developed the Labatt's Ice-beer process (a fact he kept referring to, since everyone else had jumped in the Ice-Beer bandwagon since then). He explained that it's not at all uncommon for large breweries to produce flat lager at ~10% v/v, then dilute it down to ~1/2 the strength and add gas.

(There are obvious process and economic advantages to this method)

No beer at the lecture, only tea & biscuits :(

L



trebuchet03 says:

Apr 22, 2007. 1:54 AM [REPLY](#)

Beer is carbonated via fermentation. Even commercial beer is carbonated this way.

Some beer producers still prime their bottles (especially the "craft beer" producers) -- but forced carbonation is much cheaper and faster and widely used in mass production for better color, "sludge" and clarity. Those soda casks work great for force carbonating homebrew too (that's what we have used) :)

If you just connect the CO₂ and wait, you definitely need to have the water be refrigerated while it is under pressure.

This is not exactly correct... Colder temperatures allow a higher percentage of CO₂ to enter solution - but the process of effusion and diffusion happens faster at higher temperatures. This is why a warm bottle of soda will gas off more than a cold one - sudden pressure loss at higher temperature makes the fluid *that* much more supersaturated.

Given the same stationary fluids - two factors can change the time necessary to reach saturation - pressure and temperature. High Temp = Faster Rate - Lower Gas in Solution. Higher Pressure = Faster Rate - Higher Gas in Solution. I'm trying to think back to my materials/chemistry classes as there is a very simple equation to find the rate -- it's analogous to the Arrhenius equation (which is for crystalline structures). Does anyone else know off hand?



ich bin ein pyro says:

Apr 23, 2007. 7:38 AM [REPLY](#)

its analogous to the arrhenius equation

is this even english?

[view all 65 comments](#)