

## Combustion of sugar equation

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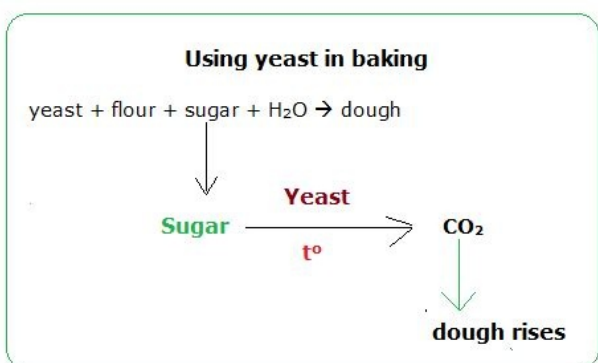
# Carbon Cycle - Combustion, Metabolism



or oxygen carbon water (heat)

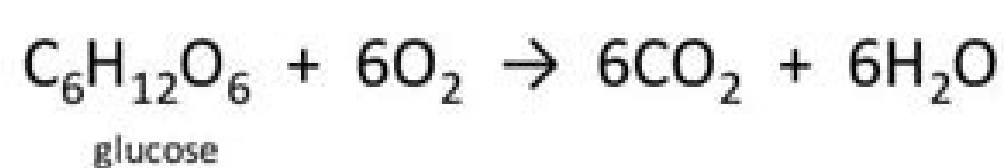


represents any fossil fuel, food, organic matter



## Combustion products of organic compounds

- When an organic compound burnt in excess oxygen, the main product are **carbon dioxide**, CO<sub>2</sub> and **water**, H<sub>2</sub>O



The balanced chemical equation for the combustion of butane is given below. How many grams of O<sub>2</sub> are needed to completely react with 5.0 g of butane in a butane lighter?

$$2 \text{C}_4\text{H}_{10} + 13 \text{O}_2 \rightarrow 8 \text{CO}_2 + 10 \text{H}_2\text{O}$$

A. 0.42 g  
 B. 18 g  
 C. 2.8 g  
 D. 6.0 g  
 E. 9.1 g

QUESTION 20

2 points Save Answer

A buffer solution contains H<sub>2</sub>CO<sub>3</sub> and HCO<sub>3</sub><sup>-</sup>, resulting in the equilibrium state shown by the reaction below. According to this reaction and LeChatelier's principle, what happens when acid (H<sub>3</sub>O<sup>+</sup>) is added to this buffer solution?

$$\text{H}_2\text{CO}_3 + \text{H}_2\text{O} \rightleftharpoons \text{HCO}_3^- + \text{H}_3\text{O}^+$$

A. The reaction shifts to the right.  
 B. More H<sub>3</sub>O<sup>+</sup> is formed.  
 C. Less H<sub>2</sub>O is formed.  
 D. More H<sub>2</sub>CO<sub>3</sub> is formed.  
 E. Adding acid does not affect the equilibrium.  
 F. More HCO<sub>3</sub><sup>-</sup> is formed.

QUESTION 21

2 points Save Answer

What happens to pH when the buffer capacity of a solution is exceeded?

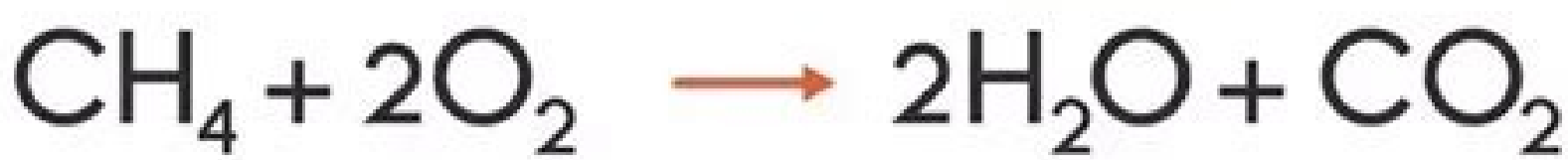
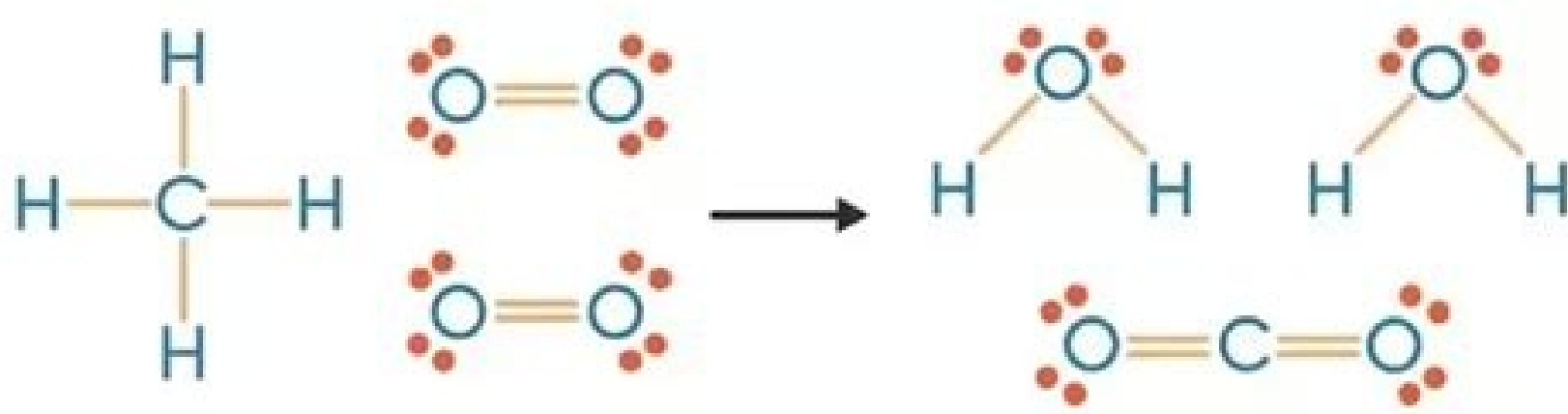
A. The solution will become unstable.  
 B. The pH decreases.  
 C. The pH will not be changed.  
 D. The pH increases.  
 E. The pH will either increase or decrease, depending on whether acid or base is added to the solution.

QUESTION 22

2 points Save Answer

If you add hydronium until all of the F<sup>-</sup> is converted into HF and then add a little more hydronium, what do you expect to observe?

A. The pH decreases.  
 B. The pH stays the same.  
 C. The pH increases.  
 D. The solution will be neutralized.  
 E. The pH changes, but it is not possible to determine how it will change.



Consider the chemical equation for the combustion of sugar. Chemical equation for combustion of sugar.

Clare Winfield These pretty sugars are so simple to make and add a distinctive scent and flavour to baked goods. Advertisement - Continue Reading Below Makes: 3 Prep Time: 0 hours 10 mins Total Time: 0 hours 10 mins 1/2 kg white caster sugar 5 g dried rose petals 5 g lemon verbena 5 g dried lavender This ingredient shopping module is created and maintained by a third party, and imported onto this page. You may be able to find more information about this and similar content on their web site. Divide the sugar between 3 sealable jars. Stir the rose petals into one jar and the lavender into the second. Tie the lemon verbena into a square of muslin and bury into the sugar in the third jar. Seal and leave for at least month in a cool dry place. Replace with more sugar as you use it. These pretty sugars are so simple to make and add a distinctive scent and flavour to baked goods. Advertisement - Continue Reading Below Everywhere you look, people seem to be touting the benefits of a sugar-free diet. But not all sugar is created equal, and no one approach is the best for every person's goals and preferences. Jessica Ziesel, M.S.P.H., R.D.N., L.D.N., a registered dietitian at Johns Hopkins Medicine, weighs in on sugar, sugar substitutes and sugar-free diets. What is sugar? Sugar is one type of carbohydrate, as are fiber and starch. Although carbohydrates are essential macronutrients (nutrients the body uses in large amounts), sugar is not. Sugar is an umbrella term for many types of simple carbohydrates, including white table sugar. Also called sucrose, this is the most common sweetener used in sweet desserts and baked goods. Sucrose is only one of several types of sugar naturally found in foods including fruits, vegetables, grains and dairy products. Other natural sugars include: Fructose Galactose Glucose Lactose Maltose Is sugar bad for you? Sugar isn't inherently bad. Actually, it's necessary. "Our bodies run on sugar," Ziesel explains. "We process the carbohydrates from the food we eat and turn much of it into glucose (sugar). Our cells pull the glucose from the bloodstream and use it for fuel and energy. Removing natural sources of sugar and other carbohydrates from your diet — fruits, dairy products and grains — is not a healthy choice. But we can make choices about where sweetness in our foods is coming from." Consider your sources of sugar There's a big difference between added sugar and naturally occurring sugar. Much sugar is added to processed foods such as donuts, bread, candy, soda, fruit punch, sweet tea, and even condiments like ketchup and barbecue sauce. The result is that many people consume a large amount of added sugar that has no nutritional benefits. And too much added sugar can lead to health problems including high blood sugar, insulin resistance, metabolic syndrome, dental issues such as cavities, increased triglycerides, obesity and type 2 diabetes. Sweeteners like fruit juice, honey, molasses and maple syrup contain natural sugar and have some nutritional benefits. "Fruit has fiber, vitamins and antioxidants," says Ziesel. "Even raw honey and maple syrup can contain antioxidants and minerals like iron, zinc, calcium and potassium." What are sugar substitutes? Sugar substitutes taste sweet but don't contain sugar. They have fewer calories than sugar, and some have no calories at all. Foods labeled "sugar-free," "keto," "low carb" or "diet" often contain sugar substitutes, which fall into three categories: artificial sweeteners, sugar alcohols and novel sweeteners. Artificial Sweeteners Most artificial sweeteners (also called nonnutritive sweeteners) are created from chemicals in a lab. A few are made from natural substances like herbs. They can be 200 to 700 times sweeter than table sugar. These sweeteners don't contain calories or sugar, but they also don't have beneficial nutrients like vitamins, fiber, minerals or antioxidants. They are regulated by the U.S. Food and Drug Administration (FDA) as food additives. Traditionally, artificial sweeteners have been the only option for people who need to monitor their blood glucose levels or weight. Some experts believe that artificial sweeteners pose health hazards, from weight gain to cancer. But research on this is ongoing, and past studies showing health risks were conducted on animals, not humans. Studies on people have shown these products to be generally safe if more than the acceptable daily intake for each is not consumed. The FDA has approved several artificial sweeteners: Acesulfame potassium (Ace-K) Advantame Aspartame Neotame Saccharin Sucralose Sugar Alcohols Similar to artificial sweeteners, sugar alcohols are created synthetically (typically from sugars themselves). Sugar alcohols are used in many processed foods. They're not as sweet as artificial sweeteners, and they add texture and taste to foods like chewing gum and hard candies. They can cause gastrointestinal irritation like bloating, gas or diarrhea in some people. Unlike other sugar substitutes, sugar alcohols must be listed on nutrition facts labels. Examples include: Erythritol Isomalt Lactitol Maltilol Sorbitol Xylitol Novel Sweeteners Novel sweeteners are derived from natural sources. This relatively new group, sometimes called "plant-derived noncaloric sweeteners," provides many of the benefits of both artificial and natural sweeteners like fruit or honey. Novel sweeteners are not a significant source of calories or sugar, so they don't lead to weight gain or blood sugar spikes. They are also typically less processed and more similar to their natural sources compared to artificial sweeteners. Examples include: Allulose Monk fruit Stevia Tagatose "Stevia and monk fruit are both naturally derived from plants," explains Ziesel. "Many people feel they have a flavor very similar to regular sugar." These are very popular sweetener options for people who need to watch their blood sugar or calorie intake. "The FDA says these sweeteners are "generally regarded as safe," which means they are safe to use for their intended purpose. Should I cut sugar from my diet? Removing all sugar from your diet means you might miss important nutrients found in fruits, whole grains and dairy. Diets that cut out all carbohydrates and sugars, such as the ketogenic diet, can be harmful to your health. Without sugar, our bodies have to find alternative sources of energy. So, they use ketone bodies (substances produced by the liver) for fuel. "This is basically our body going into starvation mode," explains Ziesel. A diet without any carbohydrates or sugars often causes a group of symptoms known as "keto flu," which can include headache, fatigue and brain fog. Ziesel recommends cutting way back on highly refined foods and beverages with added sugars and artificial sweeteners, but not removing all carbohydrates from your diet. So what are some sweet ways to stay healthy? Ziesel has a few tips for people who want to reduce the refined sugars in their diets: If you absolutely must use a sweetener, consider a sugar substitute like stevia or try using a mixture of sugar and stevia. Load up on whole foods such as fruits, vegetables, whole grains, dairy products, lean proteins, seafood, nuts and seeds. Skip the soda, energy drinks, sweet teas and fruit juices. Use whole fruit as a sweetener. Add a mashed banana to oatmeal, or blend dates into a smoothie. Read the nutrition facts label on food packages and avoid "healthy" foods that have added sugar, like granola or energy bars. 1 of 21 This is your body on fructose Americans eat a lot of sugar. And we mean a lot of sugar—on average, about 130 pounds a year. To put that in perspective: In boxing, that's the same weight as a junior lightweight—a whole person...with muscles. (Get your sugar cravings under control and lose weight while still enjoying the sweets you love with Sugar Smart Express.) So what's the big deal? Here's what's supposed to happen when you eat: Your stomach produces a hormone called ghrelin to signal your brain that you're hungry. As you start eating, your pancreas releases another hormone called insulin, which enables your body to store glucose (which you get from food) as fat. Finally, in response to the insulin, your fat cells send out a third hormone, leptin, which travels to your brain to tell it to decrease your appetite. When everything works, you're unlikely to overeat, and you can burn energy properly. Here's what happens if you eat too much sugar (which Dr. Lustig considers more than 200 calories worth of added sugar): The subsequent insulin rise can make you put on weight. But, according to endocrinologist Robert Lustig, MD, large amounts of fructose are what really wreak havoc on your system. Although both glucose and fructose are types of sugar, fructose doesn't stimulate the pancreas to release insulin the way glucose does, and it doesn't cause ghrelin levels to drop or leptin levels to rise, so your body doesn't know when it's had enough. Without those internal controls, you're liable to gain weight. Regularly consuming lots of fructose also causes your liver to accumulate fat, which makes it resistant to insulin. To compensate, your pancreas has to release more and more insulin, until finally this large, overworked gland burns out, sugar collects in your blood, and you have type 2 diabetes. What's more, the strain on your liver can lead to high blood pressure, lipid buildup, heart disease, and more abdominal ("bad") fat. Finally, fructose may also reduce your enjoyment of food. Dopamine, a neurotransmitter, signals pleasure, and new studies show that if you eat too much fructose, you tamp down your dopamine receptors so that it takes more and more fructose to feel pleasure. That's how sugar can easily become an addiction, which is why it's so hard to give up. Your first step? Knowing how much sugar you're really eating. Here's what's lurking in 20 everyday foods... 2 of 21 Chocolate milkshake Size: 10.6 oz (small) Sugar: 62 grams 3 of 21 White chocolate candy Size: 1/2 c Sugar: 50 grams 4 of 21 Raisins Size: 1/2 c Sugar: 43 grams 5 of 21 Gummy worms Size: 10 worms Sugar: 43 grams 6 of 21 Fruited yogurt Size: 8 oz Sugar: 43 grams 7 of 21 Milky Way candy bar Size: 1 bar Sugar: 36 grams 8 of 21 Grape juice (unsweetened) Size: 1 c Unsweetened: 35 grams 9 of 21 Coke or Sprite Size: 12 oz can Sugar: 33 grams 10 of 21 Pina colada Size: 4.5 oz Sugar: 31.5 grams 11 of 21 Orange juice (unsweetened) Size: 1 c Sugar: 20 grams 12 of 21 Applesauce (sweetened) Size: 1/2 c Sugar: 19 grams 13 of 21 Vanilla pudding Size: 1/2 c Sugar: 19 grams 14 of 21 Sweet-and-sour chicken (frozen entrée) Size: 1 entrée Sugar: 16 grams 15 of 21 Granola Size: 1/2 c Sugar: 13 grams 16 of 21 Carrot juice (unsweetened) 18 of 21 Banana Size: 1/2 c Sugar: 9 grams 19 of 21 Fast-food double cheeseburger on bun Size: 1 double cheeseburger Sugar: 9 grams 20 of 21 Plain cake doughnut Size: 1 donut Sugar: 8 grams

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