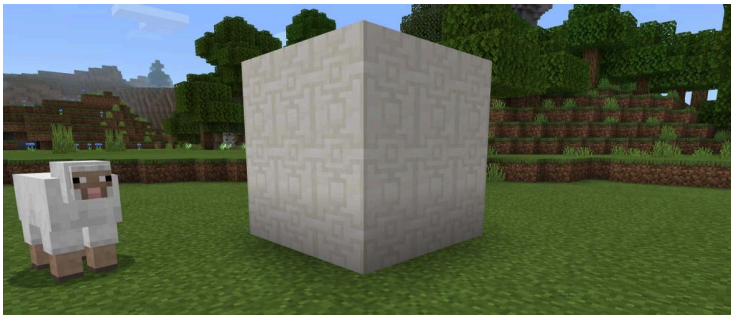
CCCHWC Science Society Newsletter (Sound of Science) May 2024
Microscopic World
Question in the Month: How does scientist define the degree of spiciness?
Send your answer to s201901056@ccchwc.edu.hk.

Is Glass a Solid?

Did you know that glass is neither a solid, a liquid, or a supercooled liquid? If so, then what is it exactly?



In a solid, molecules are closely packed in a regular pattern. Take quartz as an example of a crystalline solid. Quartz is made of pure silicon dioxide (SiO_2). In pieces of quartz, the SiO2 is arranged into a stable, orderly crystal. In a liquid, molecules are disordered and free-moving.

Strangely, glass has disordered molecules like a liquid, but is solid and rigid like a crystal. Glass is in a physical state between solid and liquid, known as an amorphous solid. It does not have a melting point, meaning the SiO_2 cannot break apart to form a true liquid. On the other hand, the SiO_2 molecules in it cannot arrange themselves into a strong structure to make a real solid, and can't flow like liquids. Some scientists looked into a 20 million-year-old amber to see if it flowed at all over its lifetime – and it did not.

You might ask: how can glass be neither a solid nor a liquid? This involves complicated glass-making processes, unlike what we do in Minecraft, so if you are interested, don't hesitate to find out more!

Paramagnetism and Colour of Oxygen

Oxygen has no colour as a gas. You can't see oxygen gas floating in mid-air. However, when cooled down to become liquid, it appears as a pale blue colour. Why is that?

First, let's talk about how we see colour. Light is a special object, it exhibits both properties of a particle and a wave, and we have

discussed the particle property in our “coloured flames” post. In this article, we treat light as an electromagnetic wave. Different colors of light have different “wavelengths”. Wavelength is the distance between each “hill” of the wave. White light, then, comprises many different wavelengths of light, like a mixture of all colours. When we look at a light source, our eyes can detect the wavelength of the light, and we can “detect” color. The range of light that we can see is called the “visible spectrum”.

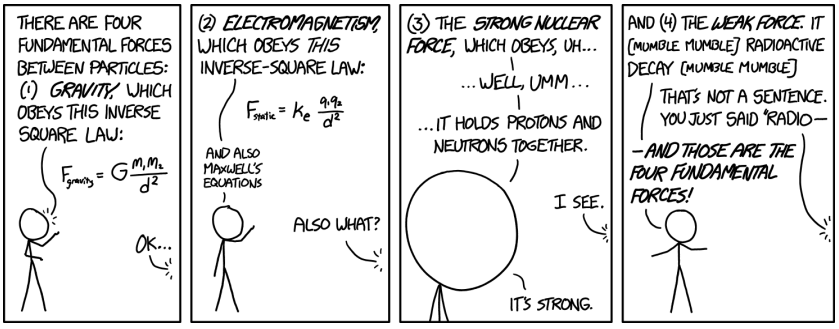
But what determines the colour of objects? We find that when white light is shone onto an object, the object absorbs some wavelengths of light, and emits the other wavelengths. The amount and the wavelengths of light absorbed and emitted depend on the substance, so different materials appear in different colours.

Oxygen in its gas state reflects or re-emits all light that is shone on it. However, when its structure changes as it becomes liquid, the light that it emits is different. It emits more blue light and partially re-emits the remaining light (white light), which contributes to its pale blue color, just like mixing blue and white colouring.

But why does oxygen do so in a liquid state? In simple words, scientists have found that liquid oxygen creates a weak magnetic attraction within the molecule, which makes it absorb the red portion of our visible spectrum, leaving the blue portion behind. The details are too complicated for high-school chemistry, so our interested readers, you may search the web for more information to find out the mysteries behind oxygen.

Relaxing Zone

					3		8	5
		1		2				
			5		7			
		4				1		
	9							
5							7	3
		2		1				
				4				9



We are also recruiting the committee members for 2024./25!
For F1 - F4 students who are interested, please contact 5D Lee Yiu Sing or Mr. Lau Chi Kin. Let's promote Science together!

Chairperson: LEE YIU SING (5D
Vice Chairperson: LEE TSOI YING (5C), CHAN HO MING (4D), WONG HO YIN (4B)
Committee Member: YIU CHEUK WANG (4B), LAW KA YAN (4C), MAK HO LONG JOSHUA (3A), MAN HOI CHING RUBY (3A), WONG TSZ WAI (3A), LEE KWAN HO (3B), AU MAN HIN (3C), WONG CHIU CHUNG (3C), CHEUNG TSZ YIN (2B), TO CHI HONG (2E)
Supervisor: Mr. LAU CHI KIN