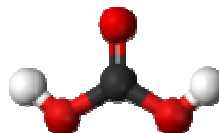
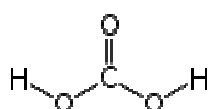


EXAMEN : Baccalauréat général - Série S-SVT ou S-SI	Session 2013
ÉPREUVE : Evaluation spécifique de Langue en section européenne	
PHYSIQUE-CHIMIE en langue ANGLAISE	
Thème : « Réactions chimiques »	Sujet n°15

Carbonic acid



Carbonic acid is the organic compound with the formula H_2CO_3 (equivalently $\text{OC}(\text{OH})_2$). It is also a name sometimes given to solutions of carbon dioxide in water (carbonated water), because such solutions contain small amounts of H_2CO_3 . Carbonic acid, which is a weak acid, forms two kinds of salts, the carbonates and the bicarbonates.

Role of carbonic acid in blood

Carbonic acid is an intermediate step in the transport of CO_2 out of the body via respiratory gas exchange. The hydration reaction of CO_2 is generally very slow in the absence of a catalyst, but red blood cells contain carbonic anhydrase, which both increases the reaction rate and dissociates a hydrogen ion (H^+) from the resulting carbonic acid, leaving bicarbonate (HCO_3^-) dissolved in the blood plasma. This catalysed reaction is reversed in the lungs, where it converts the bicarbonate back into CO_2 and allows it to be expelled. This balance plays an important role as a buffer in mammalian blood.

Role of carbonic acid in ocean chemistry

The world's oceans have absorbed almost half of the CO_2 emitted by humans from the burning of fossil fuels. The extra dissolved carbon dioxide has caused the ocean's average surface pH to shift by about 0.1 unit from pre-industrial levels. This process is known as ocean acidification.

Adapted from http://en.wikipedia.org/wiki/Carbonic_acid

mammalian : animals feeding their babies with milk

Questions :

- 1.a) Present and comment on this document.
- 1.b) Focus on at least one chemistry topic and give an example describing the acid-base reactions involved with carbonic acid.
2. How can physics and chemistry explain changes on the Earth ?