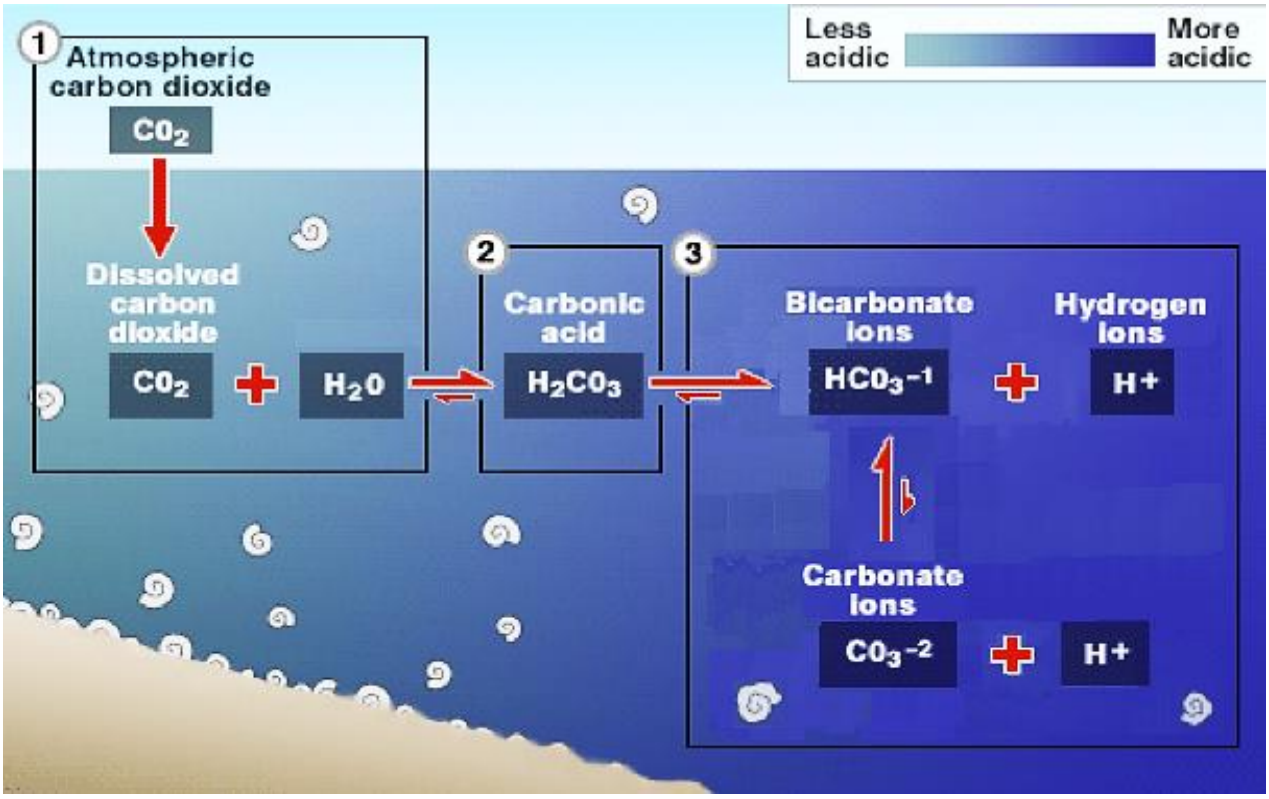
PHYSIQUE-CHIMIE en langue ANGLAISE	Sujet N°7

Ocean acidification

Ocean acidification is a term used to describe the changes in the chemistry of the world's seas, primarily as a result of burning fossil fuels. Marine scientists are concerned that changes to the oceans' pH levels will have severe consequences for marine wildlife and ecosystems. Since the Industrial Revolution, there has been a sharp increase in atmospheric CO_2 as a result of human activity, primarily from burning fossil fuels. The oceans have absorbed up to half of it, causing changes in the chemistry of surface seawater:



The CO_2 in the water, which leads to the formation of carbonic acid, has caused the pH of surface oceans to fall by 0.1 unit, and it is projected to fall a further 0.3-0.4 pH units by the end of the century.
The shift in the waters' chemical make-up not only increases its acidity, but reduces the availability of carbonate ions, which many creatures use to build shells and skeletons out of calcium carbonate.
The decrease in available carbonate ions means that organisms, such as plankton, coral and molluscs, struggle to build or maintain their protective or supportive structures.

Source : http://news.bbc.co.uk

Watch these videos and answer the following questions : **video1**
video2 (for specialists)

Questions :

1. Present and comment on the document.
2. What kind of reactions are described in the diagram ? What does a “double arrow” mean in the equations?
3. Why does increased atmospheric CO_2 lead to ocean acidification ? (explain the whole process with chemical reactions)
4. What other problems does carbon dioxide cause to our environment? What can we do to solve it?