PRACTICAL WORK: SCHWEPPES AND UV-LIGHT

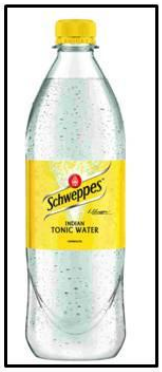
The practical work is carried out in small group; each group-mate has a role: *coordinator* (responsible for the coordination of all the different roles and of the respect of the time), *secretary* (responsible to keep records of all the information and observations), *technician* (responsible to take care of all the operations needed for the sample preparation and apparatus use), or *ambassador* (responsible for communication within the group, with other groups and with the teacher).

Materials and reactants

A glass beacker; a bottle of Schweppes; Wood lamp; $Ba(OH)_2$ saturated solution with dropper.

Procedure

In a dark room put 50 mL of Schweppes into the glass beacker. Illuminate the bottom of the beacker with the Wood lamp light: the solution emits a blue light.



Such an emission, however, disappears upon addition of about 10 mL of $Ba(OH)_2$ saturated solution to the Schweppes contained in the glass beacker.

Explanation

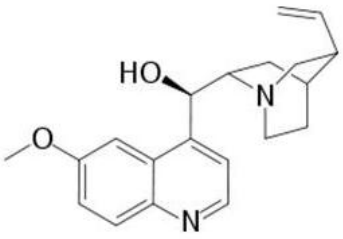
Schweppes contains quinine that, besides its medicinal properties, is used as a fluorescent standard: UV absorption peak at 350 nm, emission peak at 460 nm (blue). It means that when Schweppes is illuminated by a ultraviolet “black light” the quinine absorbs the UV light giving rise to an

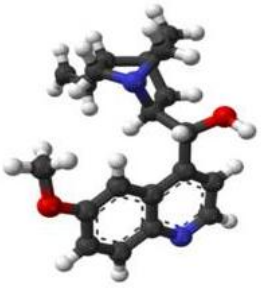
electronically excited state. This state is unstable and immediately deactivates emitting the blue light.

When the $Ba(OH)_2$ saturated solution is added to Schweppes, the blue emission disappears because the hydroxide behaves as a quencher: it absorbs the energy from the electronically exited quinine and dissipates the energy as *heat.*

Some information on quinine

Quinine is a white crystalline alkaloid having antipyretic (fever-reducing), antimalarial, analgesic (painkilling), and anti-inflammatory properties and a bitter taste. Quinine occurs naturally in the bark of the cinchona tree, though it has also been synthesized in the laboratory. The medicinal properties of the cinchona tree were originally discovered by the Quechua, who are indigenous to Peru and Bolivia.





Quinine was the first effective Western treatment for malaria caused by *Plasmodium falciparum*, appearing in therapeutics in the 17th century. It remained the antimalarial drug of choice until the 1940s, when other drugs, that have fewer unpleasant side effects, replaced it.

Note of Caution
Do not look at the light emitted by the Wood lamp
Handle with care the $Ba(OH)_2$ saturated solution