Graphene-based nanomaterials are a kind of new technological materials with high interest for physicists, chemists and materials scientists. Graphene is a two-dimensional (2-D) sheet of carbon atoms in a hexagonal configuration with atoms bonded by $sp^2$ bonds. These bonds and this electron configuration provides the extraordinary properties of graphene, such as very large surface area, a tunable band gap, high mechanical strength and high elasticity and thermal conductivity [1].

Graphene has also been investigated for preparation of composites with various semiconductors like TiO$_2$, ZnO, CdS aiming at enhanced photocatalytic activity for their use for photochemical reaction as water splitting or CO$_2$ to methanol conversion [2-3].

In this communication, the synthesis of porous graphene@TiO$_2$ obtained from a powder graphite recycled, supplied by ECOPIBA, is presented. This graphite was exfoliated, using a nonionic surfactant (Triton X-100) and sonication. Titanium(IV) isopropoxide was used as TiO$_2$ source. After removing the surfactant with a solution HCl/n-propanol, a porous solid is obtained with a specific area of 358 m$^2$. The solid was characterized by XRD, FTIR, XPS, EDX and TEM. Figure 1 shows the graphene 2D layer bonded with nanoparticles of TiO$_2$. When a water suspension of this material is exposed with UV-vis radiation, water splitting reaction is carried out and H$_2$/O$_2$ bubbles are observed (Figure 2)

References
