Bioethanol from waste paper

Target age
Age 14 and over

Level of difficulty
☐ Easy    ☑ Medium    ☐ High

Key words:
Recycling, Paper, Waste, Ethanol, Fuel

Abstract of the activity:
Bioethanol (C₂H₅OH) is an alcohol coming mainly from biomass, exploitable as an environmentally compatible fuel that can partially be used in place of fossil fuels. Currently, a mixture of gasoline and bioethanol is commercially available, the E85, composed of 85% ethanol.

In this experiment, waste paper will be used as raw material for the production of ethanol through the digestion with a safe commercial enzyme and fermentation with regular grocery store yeast. Ethanol will be then monitored through the use of either an ethanol sensor or a dye that, reacting selectively with alcohol, will change colour revealing its presence.

Learning Goals
• Be aware of the global warming
• Learning about bioethanol
• Learning how to produce ethanol from waste paper
• Learning about the preciousness of waste and how it can be resource
# Summary

**Specific Abilities** - At the end of the activity the student will be able to:

- Use vials and pipettes
- Apply the methods and verify their efficiency though systems
- Be critical about the evaluation of lab results

**Cross-curricula Links**

- Ecology/Environment
- Biology
- Chemistry

**Prerequisites** - Knowledge and skills necessary for carrying out the activity

- Laboratory techniques (weighting, use a blender)

**Time requirement**

- 1 h (first day) + 2 h (the second day)

**Instruments:** blender, thermal plate, vials

**Learning and Teaching Support Materials** - What you can find in the toolkit:

1. Lab Procedure (Module 1)
2. Students’ Cards (Module 1)
3. Tutorial Video
4. Ppt presentation for preparing a lesson with tutorial videos
5. Evaluation questions

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