IMPLEMENTING SUSTAINABLE DEVELOPMENT SKILLS IN TEACHING ORGANIC CHEMISTRY LABORATORY

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INTRODUCTION AND AIMS

➢ Among the objectives to achieve in the Campus Bizia Lab research project for a sustainable transformation in education, we mark milestones such as promoting the circular economy, the energy transition and a sustainable culture and community.

➢ We have analysed the use of hazardous waste deposits and the behaviour of students who have done practices of the department of Organic Chemistry II of the UPV/EHU to correctly separate waste.

WASTE REAL CUANTITIES AT UPV/EHU. HOW MUCH HAZARDOUS WASTE ARE COLLECTED IN YOUR UNIVERSITY?

The practices carried out in the teaching laboratories of the Organic Department in the second semester of the 2017/2018 academic year.

The total volume of hazardous waste generated is :

- Experimental Organic Chemistry: **96.04L**
- Organic Chemistry II: **45.94L.**

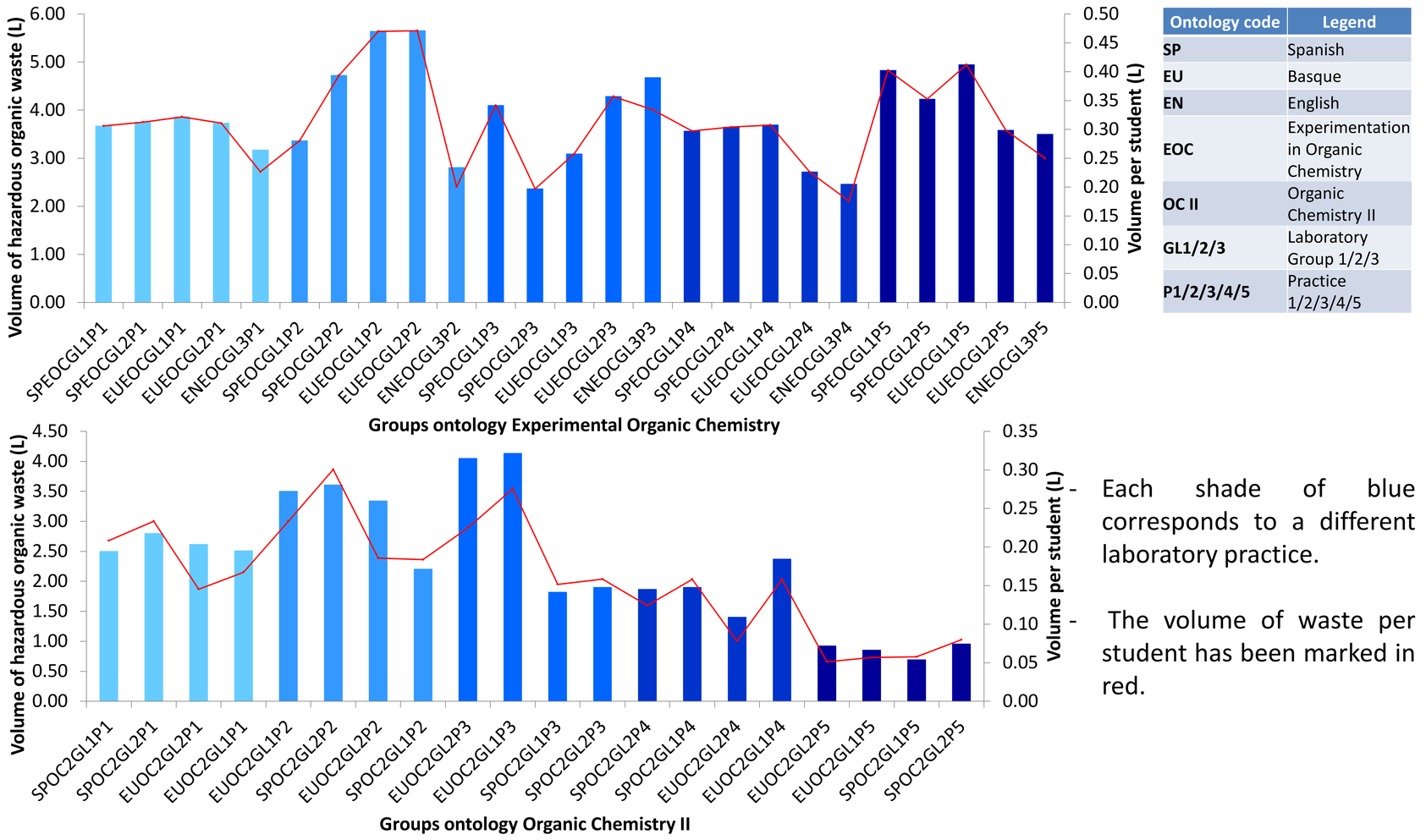
Management cost of,

- Halogenated waste: **850 € /Tn**
- Non halogenated Waste: **160€ /Tn**
- Other organic liquid waste: **650€ /Tn**

113 €

Two subjects organic liquid Waste Management and Containers Cost.





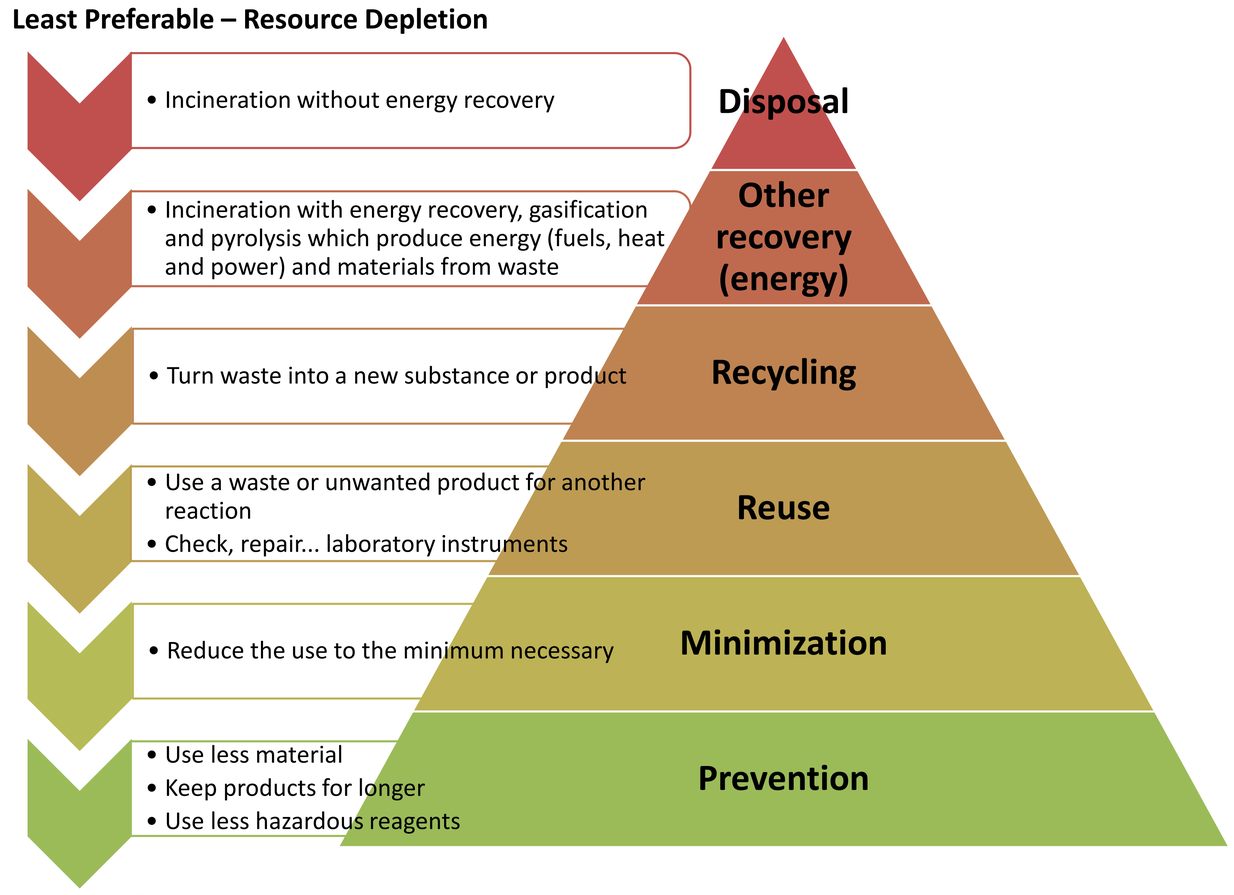
Ontology code	Legend
SP	Spanish
EU	Basque
EN	English
EOC	Experimentation in Organic Chemistry
OC II	Organic Chemistry II
GL1/2/3	Laboratory Group 1/2/3
P1/2/3/4/5	Practice 1/2/3/4/5

- Each shade of blue corresponds to a different laboratory practice.
- The volume of waste per student has been marked in red.

THE KEYS IN TEACHING ORGANIC CHEMISTRY LABORATORY

These are the keys by which the study has been governed. All of them focused on sustainable practices, ecological awareness and improvement in environmental education of students.

- **Circular Economy:** Creating properties and services in the field of sustainable development by reducing consumption and raw materials
- **Energy Transition and Efficiency:** Improving the efficiency of instrumentation, gaining efficiency.
- **Recycling:** Promoting responsible management, since recycling is easier.
- **Prepared for reuse:** The product of a process becomes a substrate of another.
- **Cheminformatics Model:** With all the data received, the model is implemented to estimate the amount of waste of the processes and for prediction.
- **Permanent University Community:** Step forward to learn more about sustainability and then use it in its field. Minimize the use of resources.
- **Prevention:** Avoiding unnecessary waste generation.

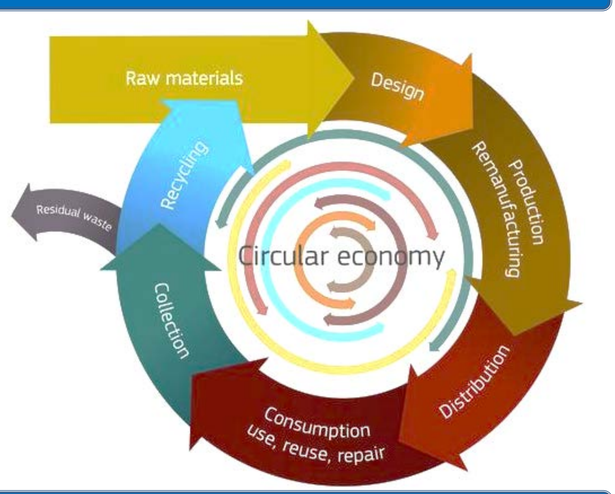


HOW CAN WE REDUCE THE WASTE IN OUR LABORATORIES? SUSTAINABILITY TRANSFORMATION IN TEACHING ORGANIC LABORATORY

Analysed how many waste produce each student pair per laboratory it is necessary to implement corrective measures:

- ✓Restore instrumentation in laboratories, and look for more sensitive techniques.
- ✓Support the transition to a Circular Economy in the university.
- ✓Implement Green Chemistry techniques.
- ✓Improve the design and reduce the volume of practices.
- ✓Use only the reagents and quantities needed.
- ✓Share the chemical reagents between laboratories.





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