PLASMA TREATMENT IN TEXTILE INDUSTRY

OER: PLASMA TREATMENT IN TEXTILE INDUSTRY

Objective & Scope

- Introduce plasma Ecotechnology and its types to scholars
- Highlight the potential of plasma as a dry and resource-efficient method in surface modifications of textiles, the different mechanisms of their interactions and its main applications
- Application of plasma as a dry method to treat textiles by developing modified samples with different properties via plasma treatment to practically apply a theoretical part of related OER

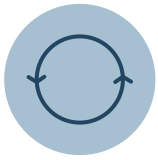
Activity Question

How can we contribute to sustainability in textile industry via plasma?

Learning Goals

- Developing practical skills
- Improving team-work abilities among the scholars
- Developing scientific reasoning abilities

Categories



Sustainability

Textile Technology

Textile Surfacing and Printing

References

- Quiz Maker. (n.d.). Quiz Maker. Retrieved 2021, from https://www.quiz-maker.com/

Support material

- OER
- Summary presentation

Equipment

- Plasma instrument
- Polyester textile
- Pipette for water drop test

A.

How can we change the properties of textile surface with no water or chemicals via plasma?

1.
Pre-session: home reading of related OER

2.
Conduct a quiz online [1] (20 mins)

3.
Discussion in groups of 4 about the answers of the quiz (20 mins)

4.
Questions from participants (10 mins)

5.
3-min paper at the end of the session, describing the main points that are learned from this session about plasma in textile industry and its contribution to sustainability

Less than or around an hour

Individual Small Group Discussion

Discover & Define

B.

How can we make hydrophilic polyester fabric with no added chemicals and no waste?

1.
Quick introduction to plasma instrument in location and safety measures (10 mins)

2.
Explain the hydrophobic property of polyester and the mechanism to modify it (10 mins)

3.
Put water droplet on fabric to show lack of absorbency

4.
Introduce the sample into the plasma instrument and adjust the setting and gas used (proposed atmospheric /O2 plasma)

5.
Apply the treatment for 5 mins

6.
Remove sample from treatment chamber

7.
Put water droplet on the treated sample to show the changes in wettability

8.
Explain the changes that have occurred and how we can customize treatment according to required result

9.
If instrument is not available in location, use pre-recorded video from HB labs conducting this process

Less than or around an hour

Small Group Discussion

Develop