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Electrohydrodynamic phenomena by DC corona discharge above liquid surface

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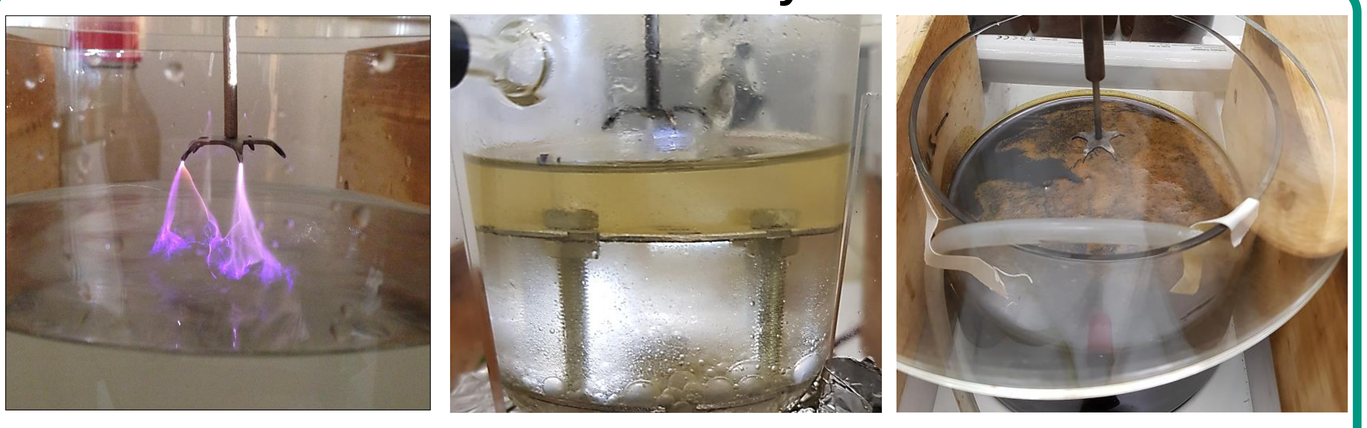
Focus of study

Behaviour of liquid surface in a DC corona discharge under the influence of electrohydrodynamic (EHD) phenomena is studied.

Following liquids are in the focus of study:

- water
- water-oil mixture
- pyrolysis oil

Test facility



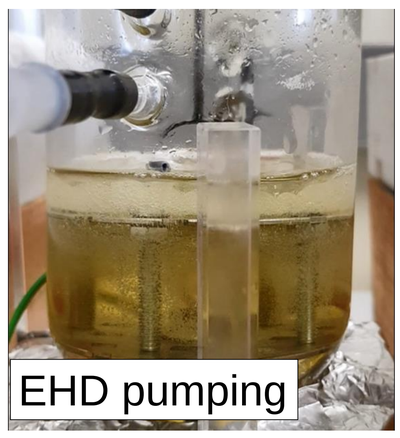
DC corona discharge above water (left), water-oil mixture (middle) and pyrolysis oil (right).

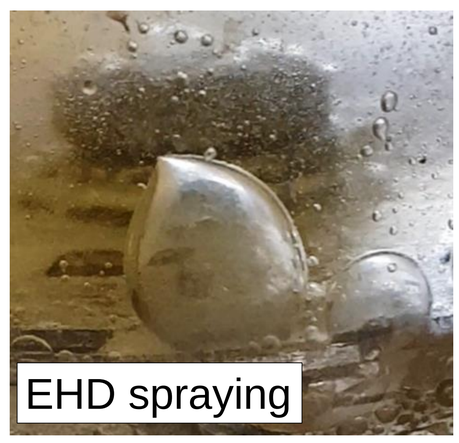
Water

- EHD-instability of liquid surface
- Liquid mixing inside vessel

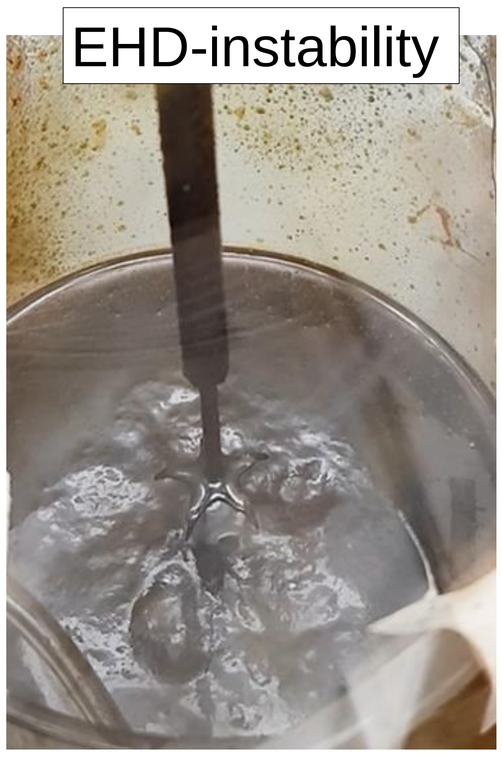
- Surface water treatment
- Water cleaning from solid waste

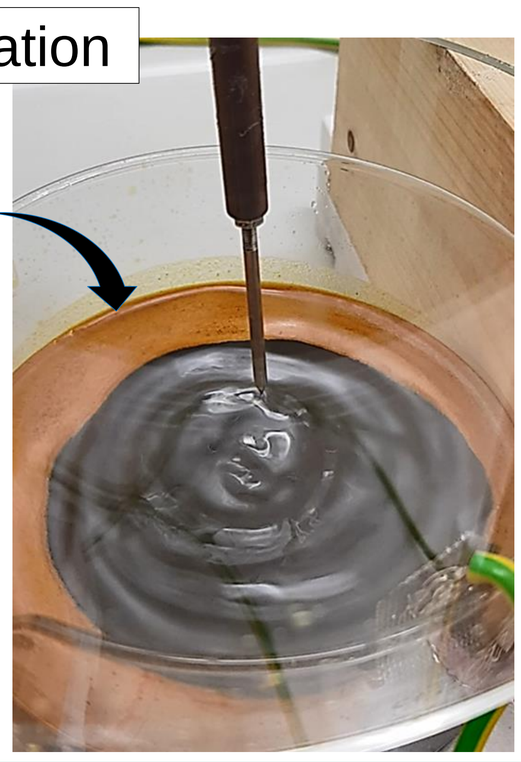
Water-oil

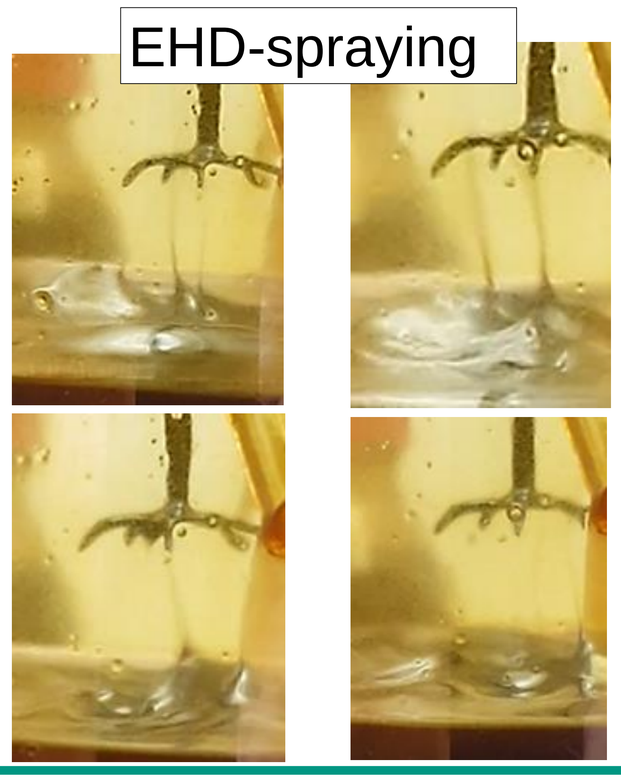




Pyrolysis oil







Conclusions

- EHD phenomena enhance water treatment and cleaning from solid impurities.
- EHD phenomena enhance liquid circulation inside the vessel and water coagulation in water-oil mixtures.
- EHD treatment results in separation of pyrolysis oil and change of its′ properties.