Ecogas - HF measurements

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HF measurements - Conditions

- Measurements with Ecomix 2 (35 % HFO, 4 % iC_4H_{10}, 1 % SF_6, 60 % CO_2)
  - In principle we agreed 4 points at the following voltages: 9800 V, 10200 V, 10600 V, 11000 V.
  - We noticed that unlike the other measurements taken in the past (STD gas mixture, Ecomix 1) the points for Ecomix 2 were not behaving linearly with the voltage. So we decided to measure a fifth point at 9000 V to confirm this.

Date	Voltage (V)	Current density (uA/cm²)	Rate (umo/h)
12 April 2021	9600	0,0186	21
13 April 2021	9200	0,01148571429	13.9
15 April 2021	9200	0,01148571429	13,13
16 April 2021	9800	0,0063	7,85
19 April 2021	11000	0,02825714286	40,82
20 April 2021	9000	0,001371428571	2,79

Table 1: Relevant parameters for the measurements

Strange current variation

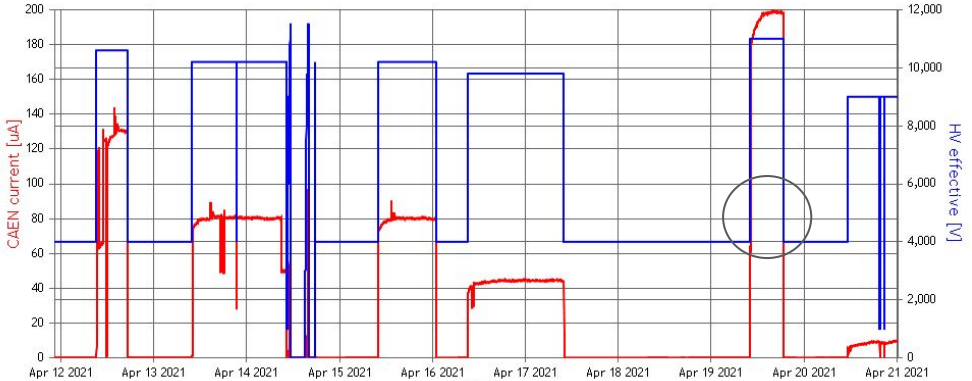


Figure 1: Current as function of time from 12 of April to 21 of April

HF measurements - results

- Spreadsheet with results: link
- A possible problem for the point at 11000 V:

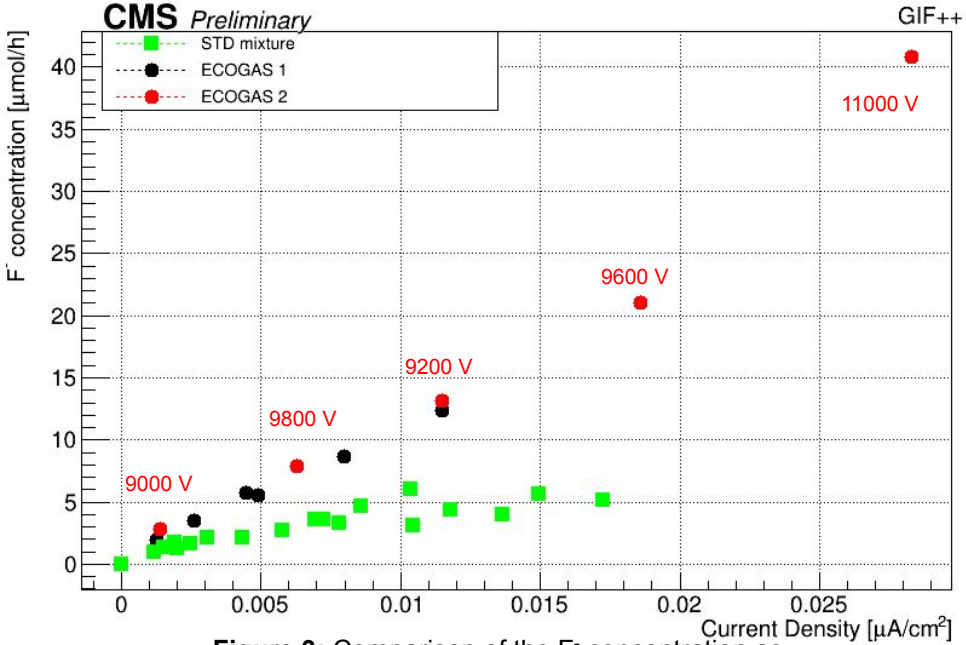


Figure 3: Comparison of the F^- concentration as function of current density for different gas mixtures

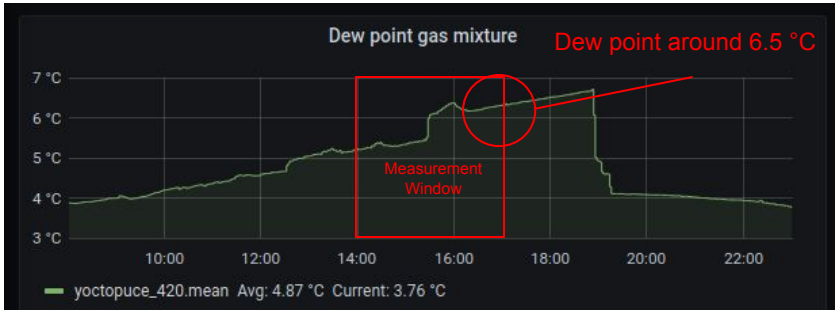
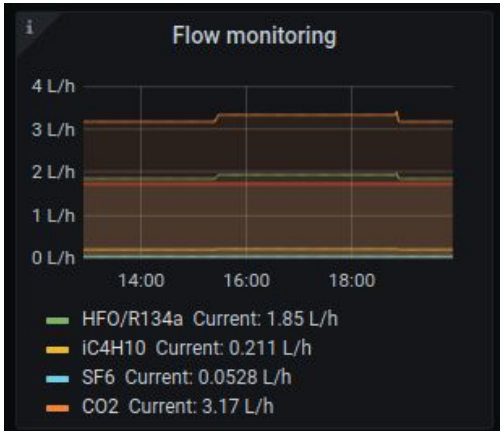


Figure 2: Dew point in function of time



A slight change in the flow

Figure 4: Small increase of the gas flow during the measurements

- **Possible** conclusion: ECOGAS 2 has a higher HF production so far (Is worth to mention that we can not compare with the other gas mixtures as we do not know the precise experimental conditions).

BACKUP

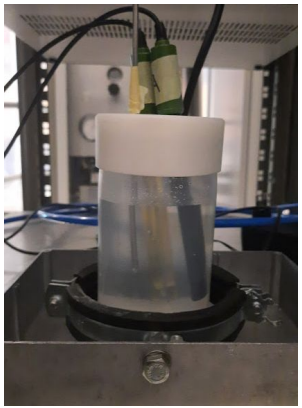
Experimental procedure

- ISE meter: Hannah HI 5222
- Cleaning of both electrodes (indicator and reference electrodes);
- Measure sampling time: 30 s
- Calibration equation (09 of April): elog

$$C_{F^-} = e^{\frac{305.09 - V}{24.72}}$$

Concentration in ppm

Voltage measured in the ISE



Electrodes position

length of the pipe inside the tube ~ 9.8 cm

Previous meeting