



EP-DT
Detector Technologies



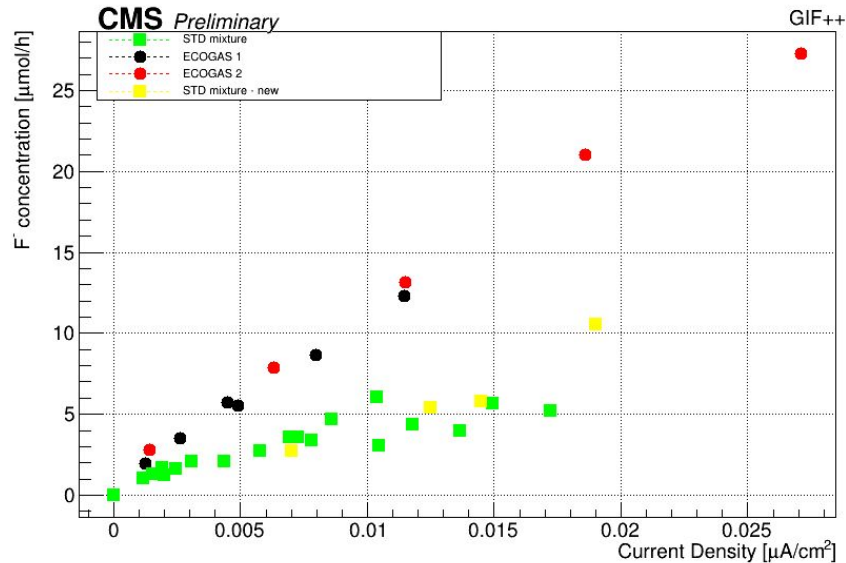
Ecogas - HF measurements

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Arena

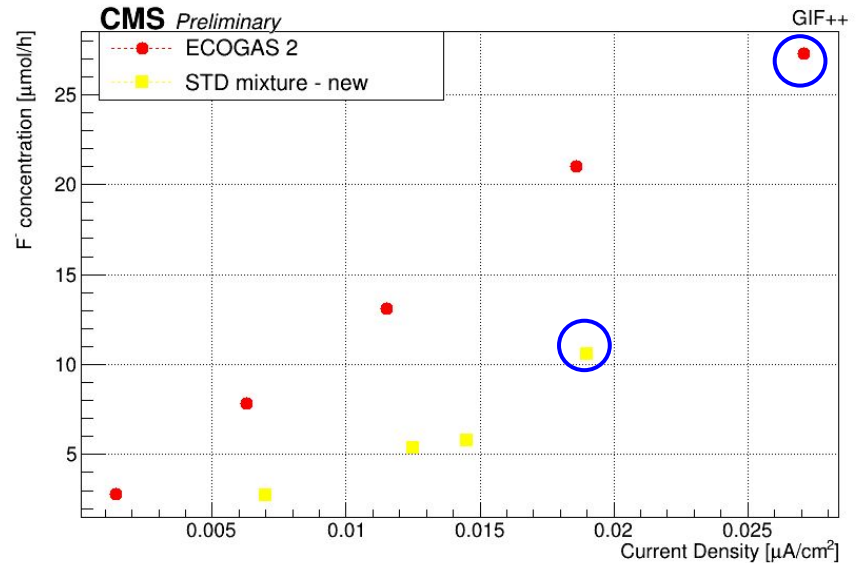
Ecogas meeting - 05/05/2021

HF measurements - results

STD Mixture and ECOGAS 1:
Andrea's measurements



Plot with only the new measurements



- We see clearly that the F⁻ concentration for Ecogas 2 is higher than for the standard gas mixture, ~2.5 times by comparing the points with the highest voltages;
- If we have more solution available would be interesting to compare with Ecogas 1.

HF measurements: summary

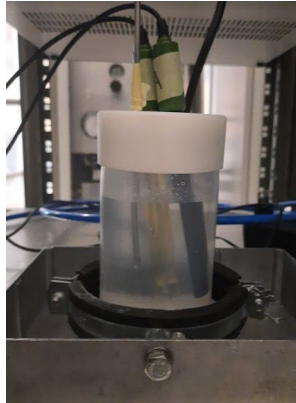
You can access this table and all data [here](#)

ECOMIX2				
Date	Voltage (V)	Current density ($\mu\text{A}/\text{cm}^2$)	Rate ($\mu\text{mol}/\text{h}$)	OBS
12 April 2021	10600	0.0186	21	-
13 April 2021	10200	0.0115	13.9	Bad data: flowmeter variation during the measurement
15 April 2021	10200	0.0115	13.13	-
16 April 2021	9800	0.0063	7.85	-
19 April 2021	11000	0.0283	40.82	Bad data: problem in gas flow
20 April 2021	9000	0.0014	2.79	-
22 April 2021	11000	0.027	27.27	-
Standard Gas mixture				
Date	Voltage (V)	Current density ($\mu\text{A}/\text{cm}^2$)	Rate ($\mu\text{mol}/\text{h}$)	OBS
27 April 2021	9800	0.019	10.56	-
29 April 2021	9600	0.014	5.78	-
03 May 2021	9400	0.013	5.39	-
04 May 2021	9000	0.007	2.74	-

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



Electrodes position

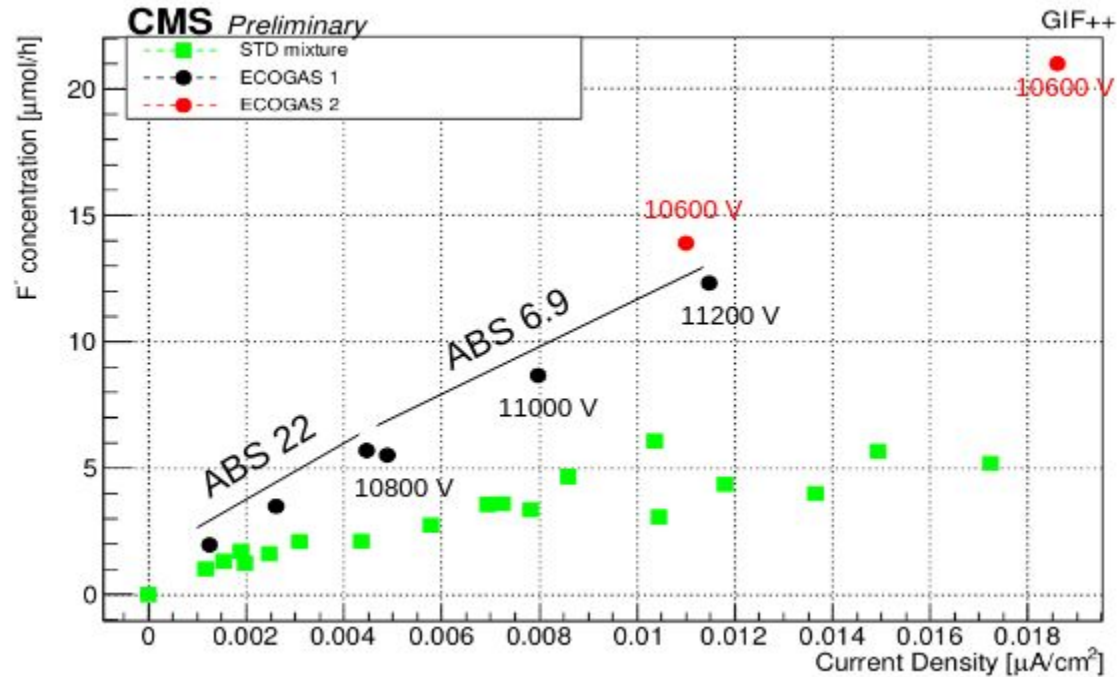
length of the pipe inside the
tube ~ 9.8 cm

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

Concentration
in ppm

Voltage
measured
in the ISE

Previous meeting



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 ($\mu A/cm^2$)	Rate ($\mu mo/h$)
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

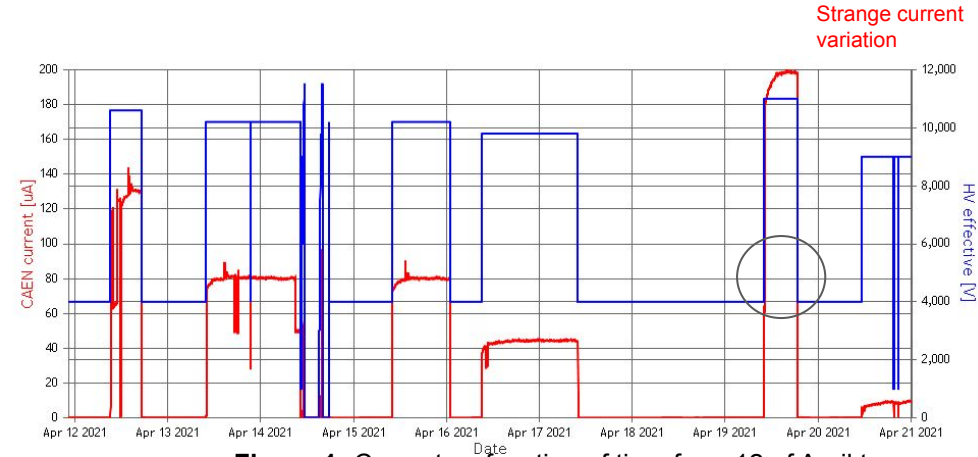


Figure 1: Current as function of time from 12 of April to 21 of April