Analysis of metal impurities for fuel cells (ICP-MS)

Analysis of metal Impurities in CCM and elution test of metal in peripheral components

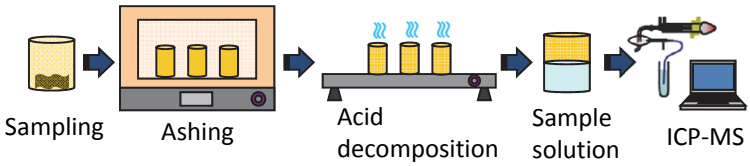
It is known that metal contamination accelerates the degradation of polymer electrolyte fuel cells, therefore the evaluation of metal contamination is important. Analysis of metal impurities using ICP-MS can be applied to investigation of metal contamination from peripheral components.

Analysis of Metal impurities in CCM before/after power generation

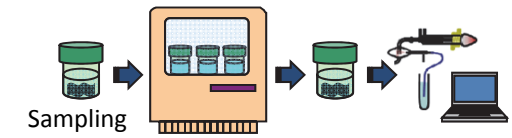
CCM: Catalyst Coated Membrane

1. Sample preparation

★ Chemical decomposition method



★ Extraction method



2. Results of analysis

unit : μg / g

Sample	Sample preparation	Na	Al	Ca	Cr	Fe	Co
Before power generation	Chemical decomposition	230	1.4	2.8	< 0.5	4.5	1300
	Extraction	230	1.3	2.6	0.2	4.2	1300
After power generation	Chemical decomposition	240	3.8	11	< 0.5	9.8	1300
	Extraction	240	3.7	11	0.3	9.9	1200

Al, Ca and Fe in CCM were increased by power generation.

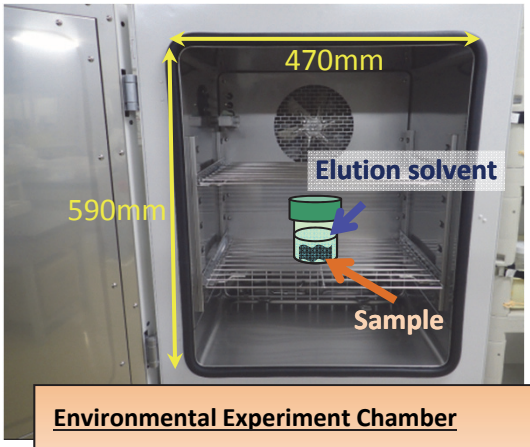
3. Comparison of sample preparations

	Chemical decomposition	Extraction
Evaluation of metal contamination from peripheral components	◎ (Surface+bulk)	○ (Surface)
Speed of analysis, Cost per analysis	○	◎
Sample size	~1 cm square	~10 cm square

By applying the optimum preparation, metal contamination can be evaluated.

Metal elution tests for various components

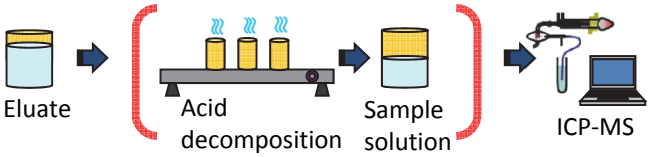
Elution test



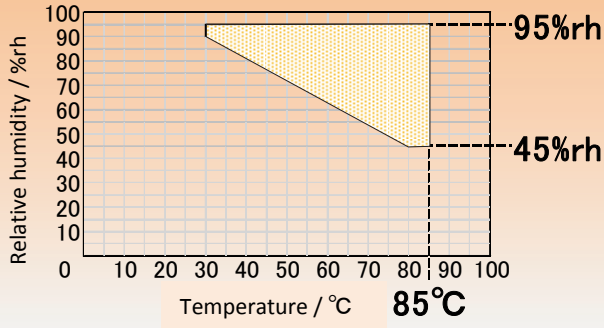
Environmental Experiment Chamber

Chamber volume : 105 L

Load capacity : 5 kg per shelf board



Temperature and humidity controllable range



Metal elution tests for fuel cell parts and peripheral components are possible. We provide reliable data by performing through from elution tests to ICP-MS measurements.