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Supporting Information

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A platinum-free zero-carbon emission easy fuelling direct hydrazine fuel cell for vehicles**

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Supporting Information 1

Experimental methods of hydrazine fixed polymer

Adsorption: At room temperature, 2 g of absorbent polymer mixed with 0.76 g of 10% by weight hydrazine hydrate used for fixing. Then, the hydrazine fixed polymer was washed with isopropylalchol and dried under vacuum overnight. The amounts of fixed hydrazine were calculated by subtracting the remaining hydrazine in the water used for washing.

Desorption: 0.3 g of hydrazine fixed polymer mixed with water or a KOH aqueous solution for 1 hour. The polymer was then filtered. The amounts of desorbed hydrazine were calculated from the hydrazine in the filtered solution.

Readsorption: 0.6 g of the polymer after hydrazine desorption was mixed with 0.23 g of 10% by weight hydrazine hydrate used for fixing. The hydrazine fixed polymer was then washed with isopropylalchol and dried under vacuum overnight. The amounts of fixed hydrazine were calculated by subtracting the remaining hydrazine in the solution used for washing.

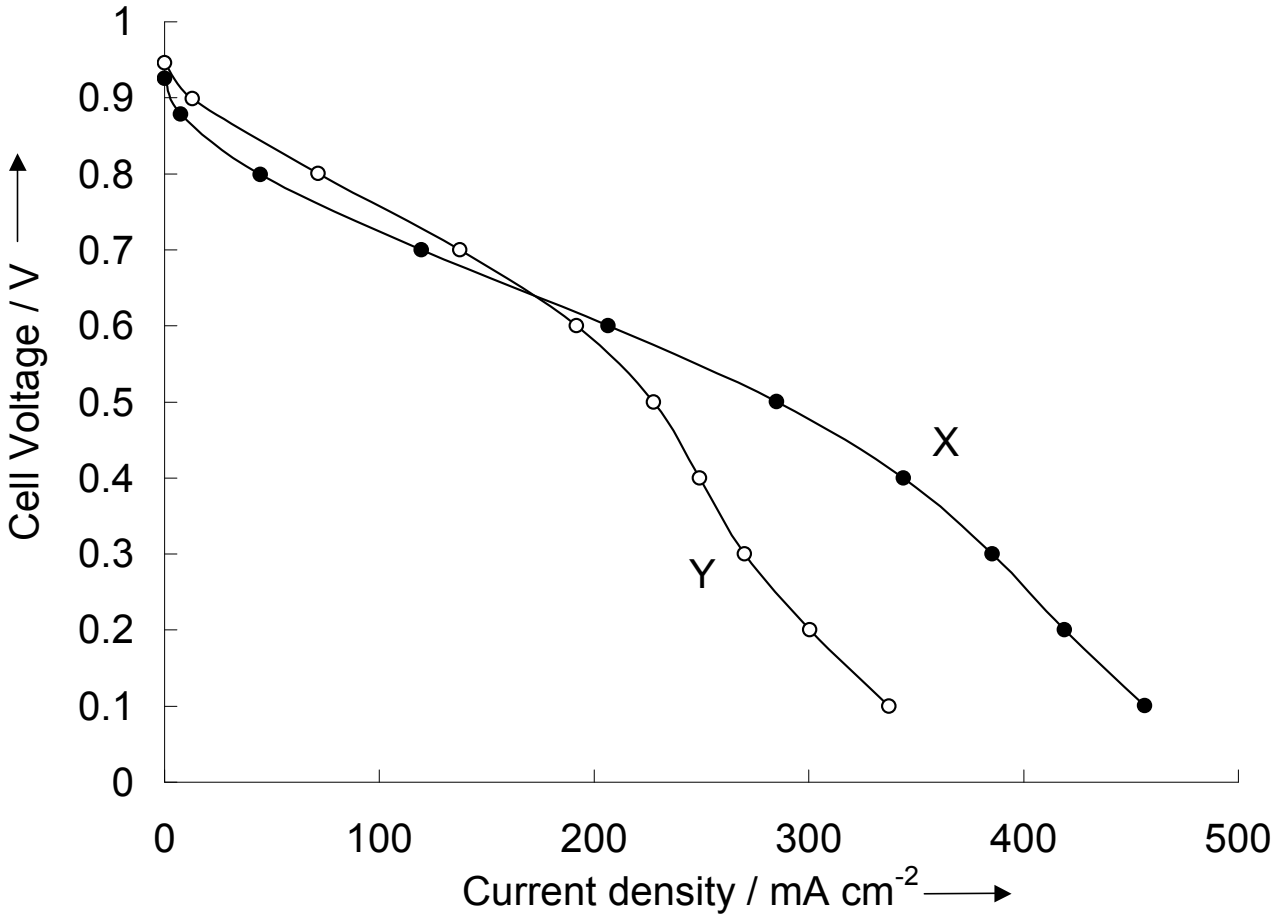

Figure S1. Current-Voltage performance of direct hydrazine anion exchange PEFCs. Ag/C cathode (X), Pt/C cathode (Y), Hydrazine was dissolved 0.67 M in 1 M KOH aqueous solution and supplied at 2 ml min^{-1}, Air 500 ml min^{-1}, 30°C, +20 kPa, Co anode, Anion exchange polymer electrolyte B.

Table S1. An adsorption-desorption-readsorption examination of hydrazine.

	Adsorption	Desorption		Readsoption
	R.T.	R.T.	80°C	R.T.
Substitutional rate of carbonyl groups of hydrazine fixed polymer / %	108.2	27.9	16.1	78.7