Supplementary Material

Conversion of Waste Synthesis Gas to Desalination Catalyst at Ambient Temperatures

David D. J. Antia

DCA Consultants Ltd., The Bungalow, Castleton Farm, Falkirk, FK2 8SD, UK;
dcacl@btconnect.com

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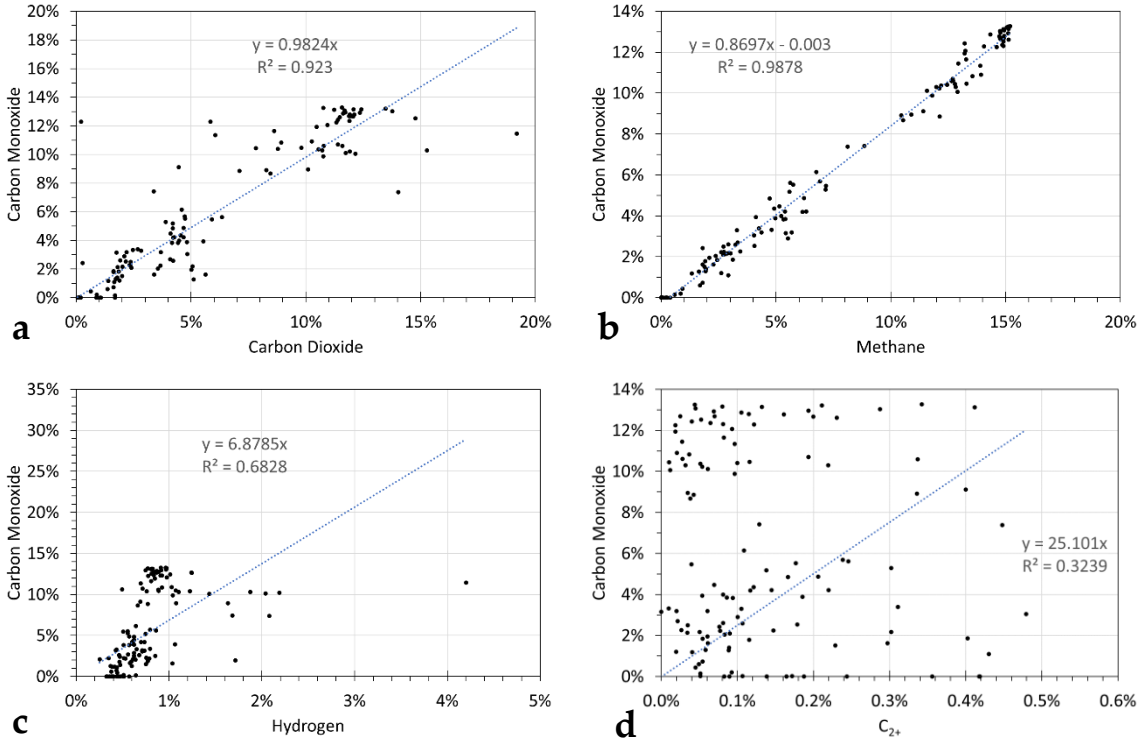

Figure S1. USA. Carbon monoxide relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%. (a), CO_2 vs. CO; (b), CH_4 vs. CO; (c), H_2 vs. CO; (d), CH_4 vs. CO.

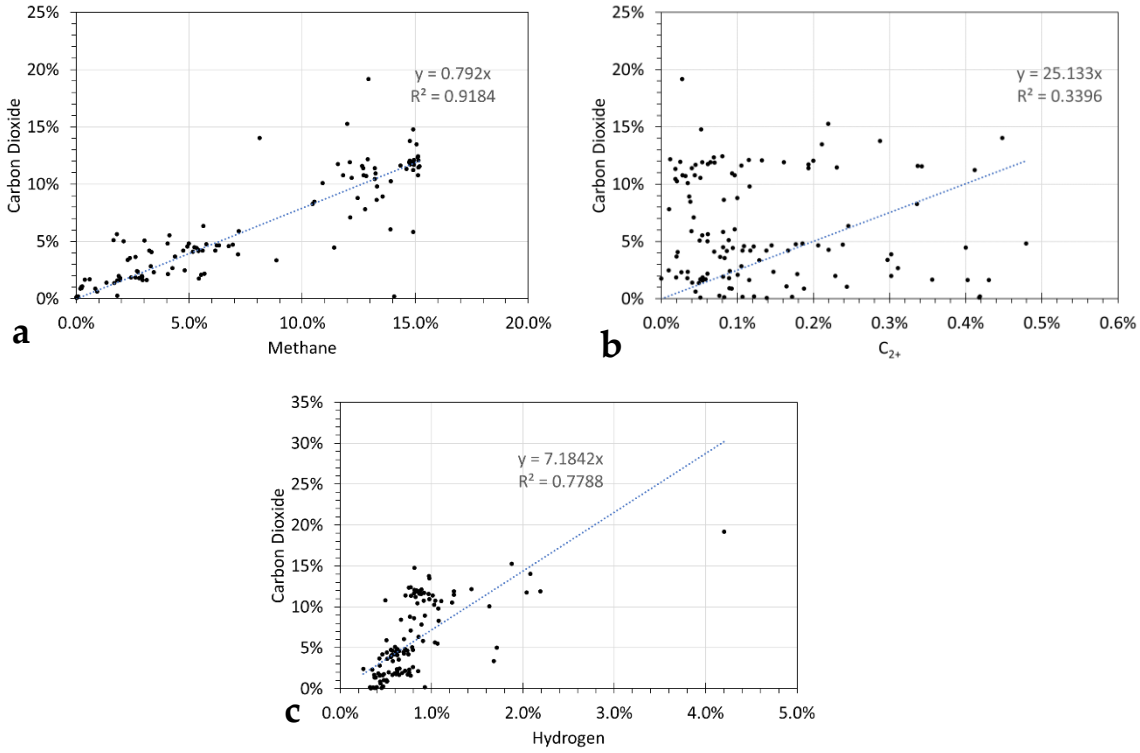

Figure S2. USA. Carbon dioxide relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%. (a), CH_4 vs. CO_2; (b), C_{2+} vs. CO_2; (c), H_2 vs. CO_2.

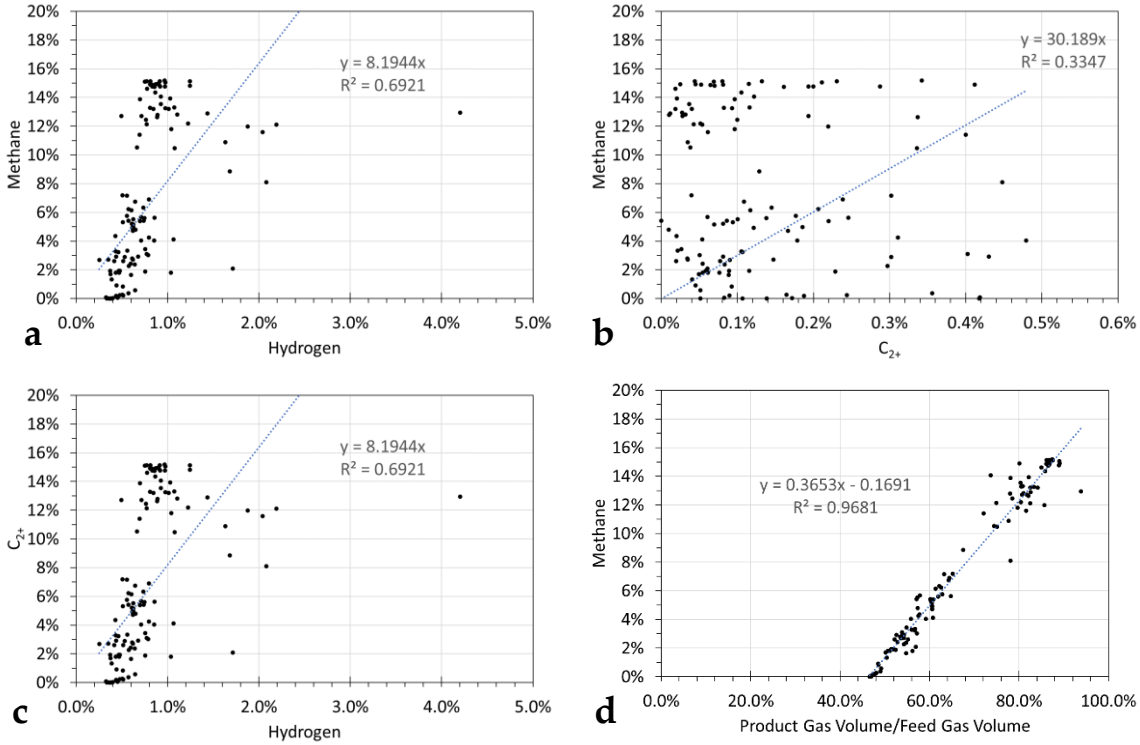

Figure S3. USA. Methane and Hydrogen relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%. (a), H_2 vs. CH_4; (b), C_{2+} vs. CH_4; (c), H_2 vs. C_{2+}; (d), [product gas volume/feed gas volume] vs. CH_4.

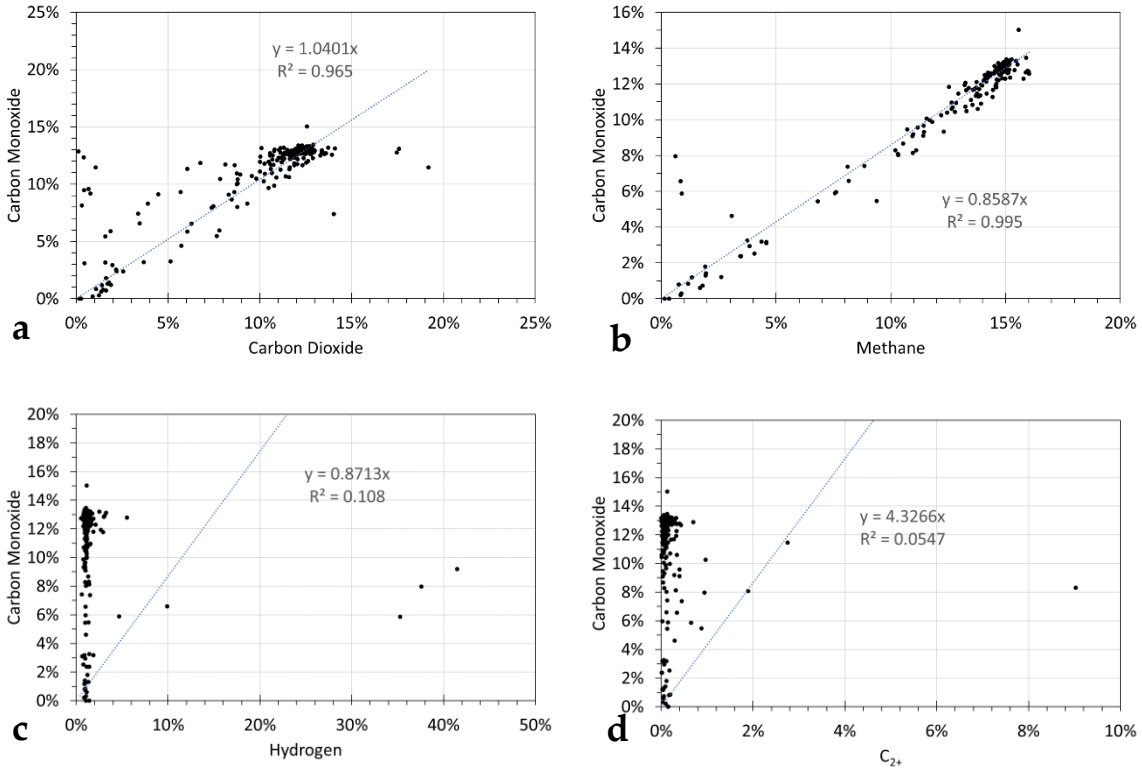

Figure S4. EPB. Carbon monoxide relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%. (a), CO_2 vs. CO; (b), CH_4 vs. CO; (c), H_2 vs. CO; (d), CH_4 vs. CO.

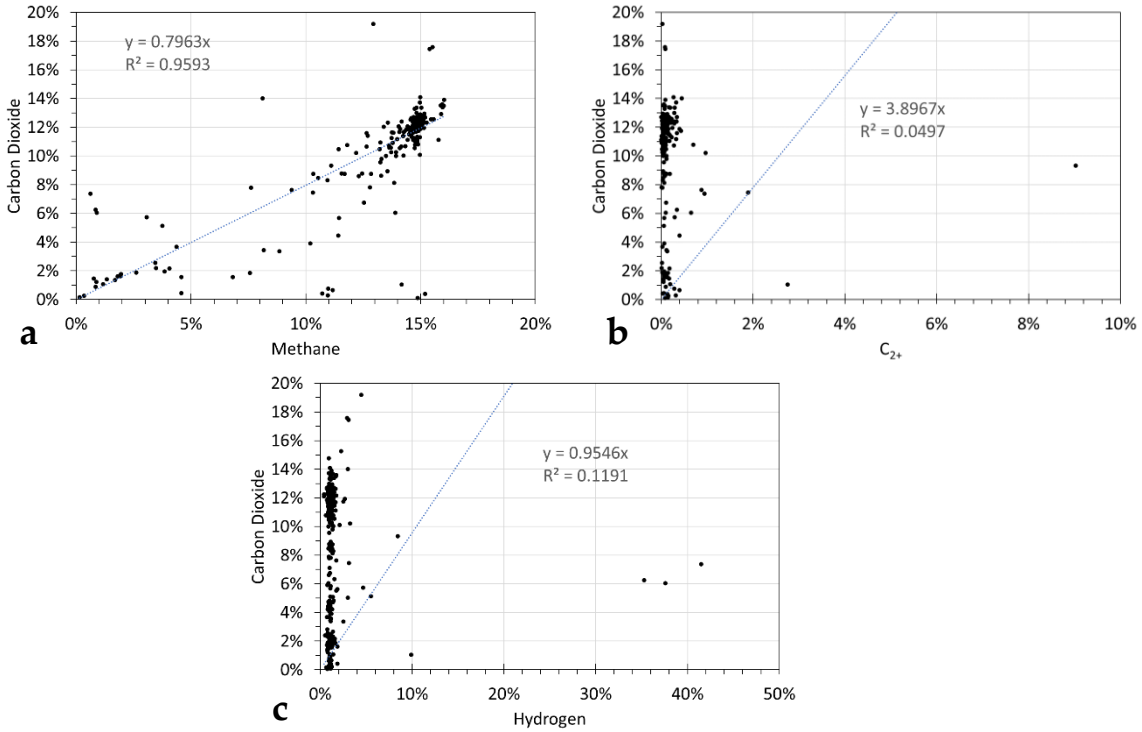

Figure S5. EPB. Carbon dioxide relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%.%. (a), CH_4 vs. CO_2; (b), C_{2+} vs. CO_2; (c), H_2 vs. CO_2.

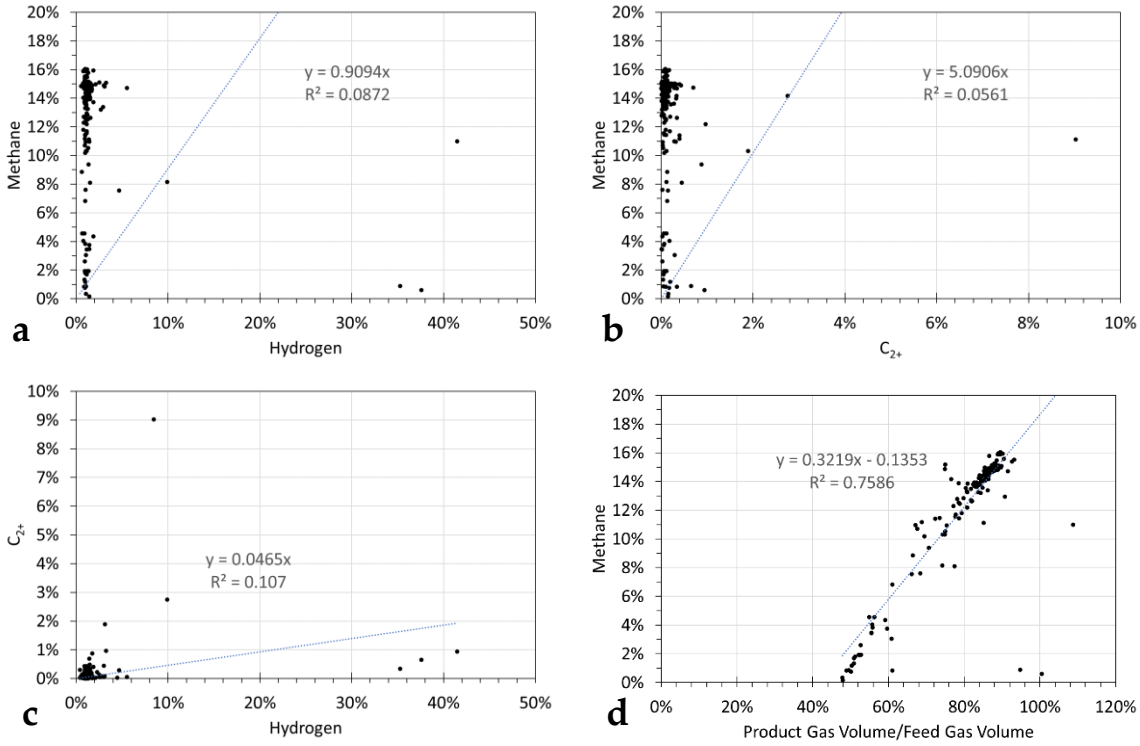

Figure S6. EPB. Methane and Hydrogen relationships. All molar proportions are normalised to a N_2 concentration in the feed gas of 46.03%. a), H_2 vs. CH_4; (b), C_{2+} vs. CH_4; (c), H_2 vs. C_{2+}; (d), [product gas volume/feed gas volume] vs. CH_4.

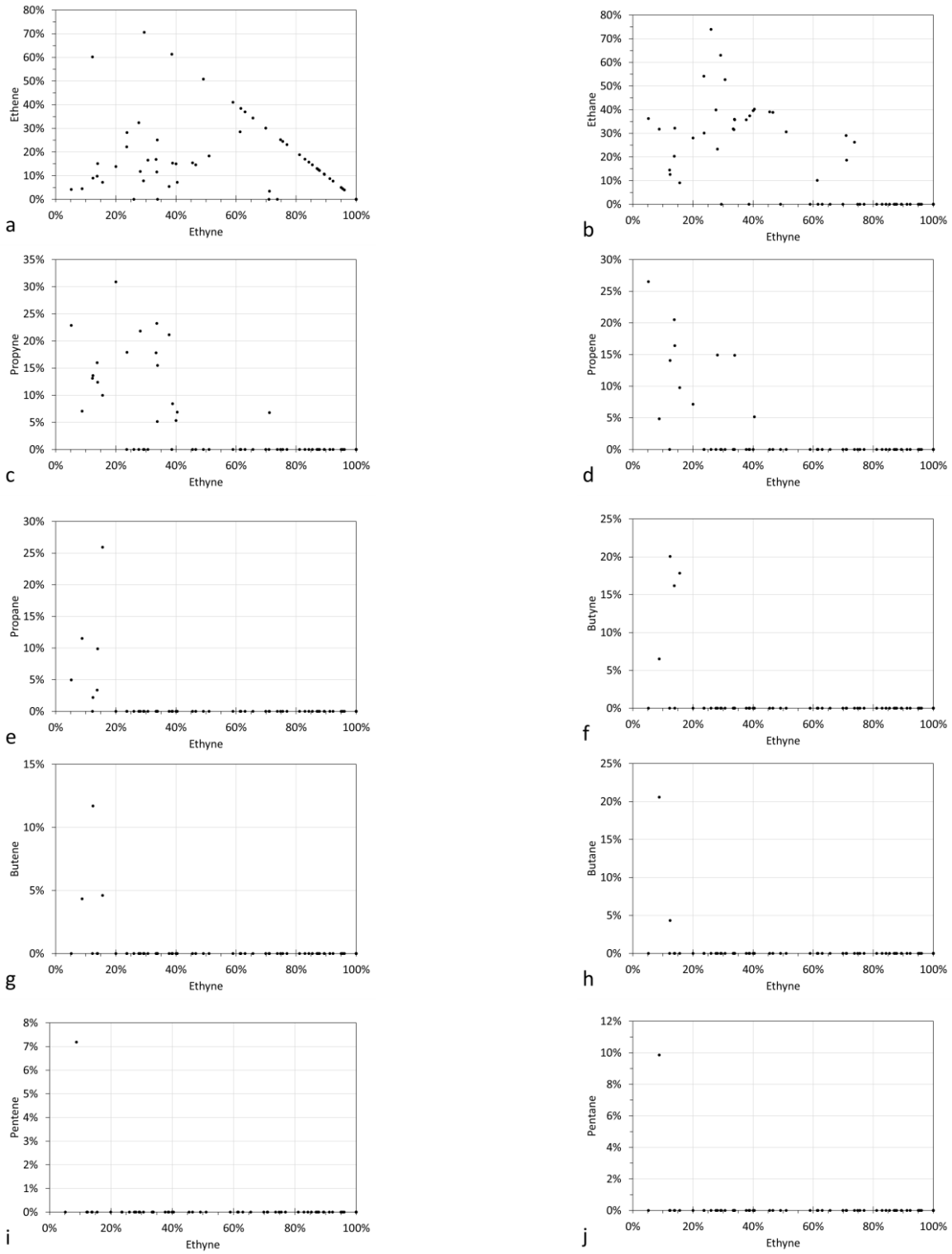

Figure S7. USA Hydrocarbon compositions in the product gas. (a), Ethyne vs. Ethene; (b), Ethyne vs. Ethane; (c), Ethyne vs. Propyne; (d), Ethyne vs. Propene; (e), Ethyne vs. Propane; (f), Ethyne vs. Butyne; (g), Ethyne vs. Butene; (h), Ethyne vs. Butane; (i), Ethyne vs. Pentene; (j), Ethyne vs. Pentane.

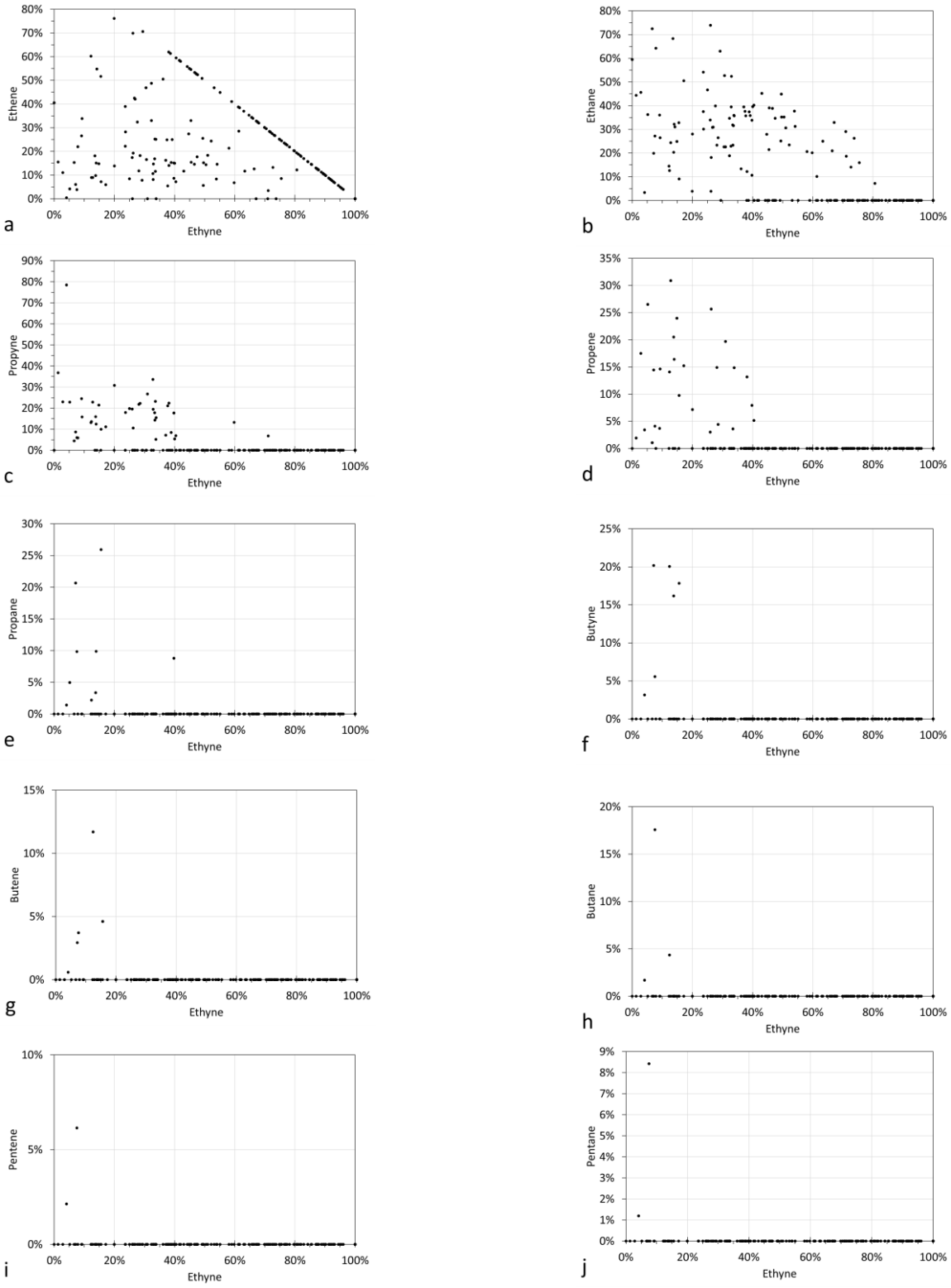

Figure S8. EPB. Hydrocarbon Product Compositions. (a), Ethyne vs. Ethene; (b), Ethyne vs. Ethane; (c), Ethyne vs. Propyne; (d), Ethyne vs. Propene; (e), Ethyne vs. Propane; (f), Ethyne vs. Butyne; (g), Ethyne vs. Butene; (h), Ethyne vs. Butane; (i), Ethyne vs. Pentene; (j), Ethyne vs. Pentane.

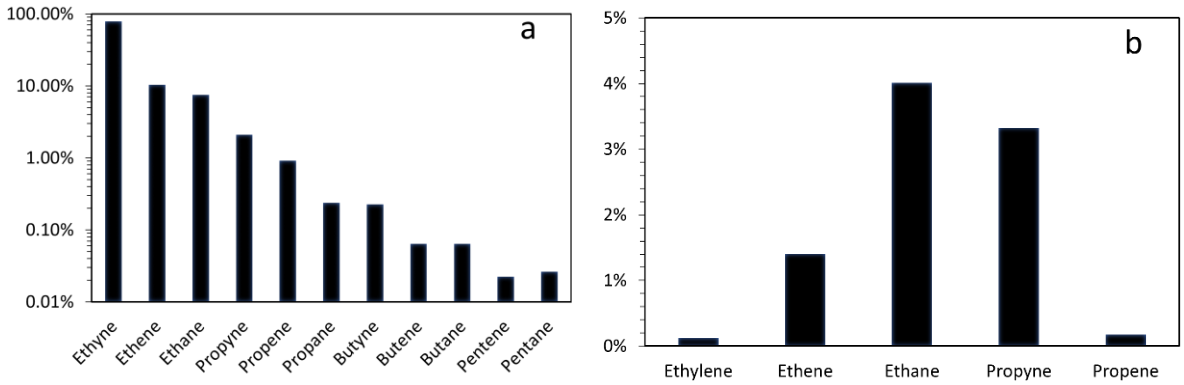

Figure S9. EPB. Composition of the generated C_{2+} hydrocarbons in the product gas. (a), Average product composition; Composition normalized to the C_{2+} composition in the product gas. Average of 373 measurements; (b), composition of the largest volume hydrocarbon pulse recorded. Composition normalised to N_2 concentration in the product gas.