Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Big Problem, Little Answer: Overcoming Bed Agglomeration and Reactor Slagging during the Gasification of Barley Straw under Continuous Operation

Hassan A. Alabdrabalameer[a], Martin J. Taylor[b]*, Juho Kauppinen[c], Teemu Soini[c,d], Toni Pikkarainen[c] and Vasiliki Skoulou[a,b]*

[a] B3 Challenge Group, Department of Chemical Engineering, University of Hull, Cottingham Road, Hull, HU6 7RX, United Kingdom.

[b] Energy and Environment Institute, University of Hull, Cottingham Road, Hull, HU6 7RX, United Kingdom.

[c] VTT Technical Research Centre of Finland Ltd, Renewable Energy Processes, Espoo, Finland.

[d] Reteres Oy, Kytömaantie 32, 41390 Äijälä, Finland

Supplementary Information

Table S1: Experimental conditions *of the gasification reactor shown in* ***Figure 1***

Parameters	Values
Bed Temperature (°C)	750-950
Superficial velocity (m/s)	0.36-0.42
Bed material particle size (µm)	250-500
Oxygen in feed (%)	1-1.2
Feedstock particle size (mm)	1-2
Feeding rate (r/min)	15-100

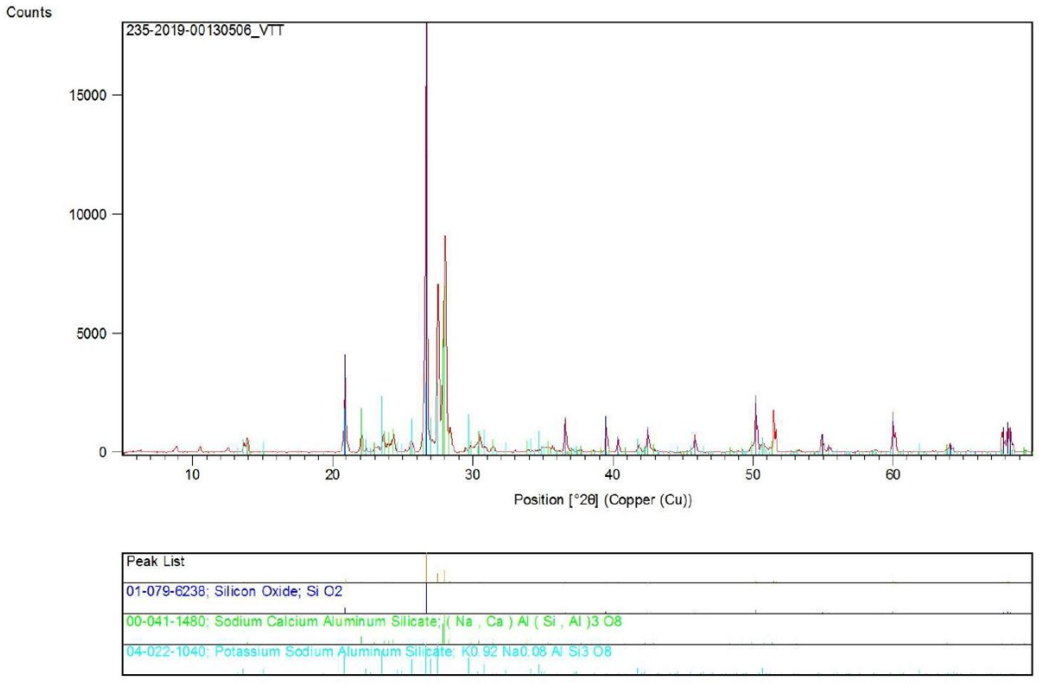

Figure S1: PXRD Diffractogram of untreated bed material

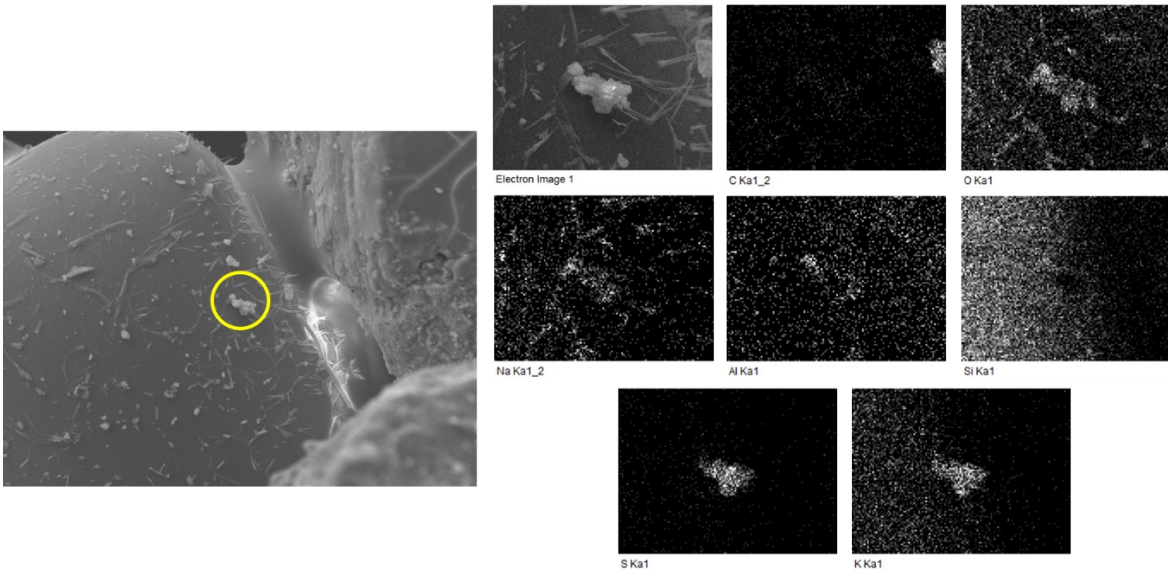

Figure S2 shows EDX mapping of an inorganic structure observed in **Figure 4a** in the manuscript, this clearly shows the strong signal for K, O and S, suggesting a K_2SO_4 structure.