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**Modification of biomass ash by aluminosilicates and other additives**David Nichols, Colin Snape and David Large  
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The slagging and fouling characteristics of biomass fuels can act as a barrier to their use as a fuel for thermal power generation. Biomasses with high alkali metal and alkaline earth metal contents have particularly high slagging and fouling propensities due to the formation of low melting temperature mineral phases. The use of additives has previously been shown to inhibit the volatilization of alkali and alkaline earth containing species during combustion. The aim of this study is to obtain fundamental information on interactions between alkali/alkaline earth metals and additives, particularly preventing the formation of low melting phases. Under slow heating conditions using a furnace and TGA, biomass ashes produced at low temperature have been heated to high temperatures with clay additives. The rates of alkali and alkaline earth metal retention by the use of different additives are being studied quantitatively. The same tests are being conducted in a drop tube furnace to replicate fast heating rate pulverized fuel combustion conditions. The ashes are being analyzed by SEM-EDX and XRF/ICP to identify minerals present and identify the impact of the additives on the low melting phases produced at combustion temperatures. Initial mass balances suggest that clay additives do not necessarily enhance the retention of potassium in all cases.

**Biography**

David Nichols graduated from Bangor University, UK in 2014 with a Master of Chemistry (MChem) degree. He is now a Research Engineer at the University of Nottingham pursuing an Engineering Doctorate (EngD) at Centre for Doctoral Training (CDT) in Carbon Capture and Storage and Cleaner Fossil Energy.

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