



***Ph.D. School in Chemical Sciences
Cycle XXXVIII***

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Research project title : Industrial valorisation of ash from residual biomass gasification processes

Key words: Gasification; Ash; Cementitious materials; Adsorption; Waste reuse

Research project abstract: Hydrogen production via residual biomass gasification (coming from, e.g., agroforestry, or based on civil/industrial sludges) is an example of sustainable circular economy, to use energetic sources alternative to fossil ones, which instead cause socio-political concerns. Reuse of gasification ash via (i) synthesis of environmentally friendly construction materials, and (ii) adsorption for fluids purification, enhances the circular nature of the process. Industrial gasification ashes will be characterised for their physico-chemical and microstructural properties, and valorisation routes (i) and (ii) will be followed. Aim is to study the inter-relations establishing among ash properties, operating conditions of processes (i)/(ii), properties of the binding materials/efficacy of the adsorption process, physico-chemical interactions between ashes and other species, for the development of industrial valorisation processes in chemical plants.