Comparison of phosphorus recovery from incineration and gasification sewage sludge ash - DTU Orbit (12/02/2019)

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Incineration of sewage sludge is a common practice in many western countries. Gasification is an attractive option because of its high energy efficiency and flexibility in the usage of the produced gas. However, they both unavoidably produce sewage sludge ash (SSA), a material which is rich in phosphorus (P), but that it is commonly landfilled or used in construction materials. With current uncertainty in phosphate rock (PR) supply, P recovery from SSA has become interesting. In the present work, ashes from incineration and gasification of the same sewage sludge were compared in terms of P extractability using electrodialytic (ED) methods. The results show that comparable recovery rates of P were achieved with a single ED step for incineration SSA and a sequential combination of two ED steps for gasification SSA, which was due to a higher influence of Fe and/or Al in P solubility for the latter. A product with lower level of metallic impurities and comparable to wet process phosphoric acid (WPA) was eventually obtained from gasification SSA. Thus, gasification becomes an interesting alternative to incineration also in terms of P separation.

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