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Torrefaction of Spelt Husks to Increase Its Fuel Properties

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Abstract : Torrefaction is a term that refers to the moderate pyrolysis of biomass at temperatures between 200 and 300oC in an oxygen-free environment to boost its heating value, grindability, and storability. This process can also be used as a pre-treatment for other thermochemical processes. The torrefaction of spelt husks was carried out at temperatures of 200, 250, and 300oC in an inert nitrogen environment with a heating rate of 20oC.min-1 and a residence time of 15–60 min, respectively. We examined the influence of torrefaction temperatures and residence time. The results indicated that increasing the torrefaction temperature increased the higher heating values (HHV) and improved grindability. Torrefied spelt husks at 300oC for 15 minutes exhibited the highest increase in HHV at 30.88 MJ kg-1, compared to non-torrefied spelt husks at 17.56 MJ kg-1.

Keywords : grindability, higher heating value, residence time, temperature, torrefaction
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