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Abstract: This article describes an experimental study on ash deposition during the co-firing of bituminous coal with pine sawdust and olive stones in a laboratory furnace. The main objective of this study was to relate the ash deposit rates with the type of biomass burned and its thermal percentage in the blend. The thermal percentage of biomass in the blend was varied between 10% and 50% for both sawdust and olive stones. For comparison purposes, tests have also been performed using only coal or only biomass. During the tests, deposits were collected with the aid of an air-cooled deposition probe placed far from the flame region, where the mean gas temperature was around 640 degrees C. A number of deposit samples were subsequently analyzed on a scanning electron microscope equipped with an energy dispersive X-ray detector. Results indicate that blending sawdust with coal decreases the deposition rate as compared with the firing of unblended coal due to both the sawdust low ash content and its low alkalis content. The co-firing of coal and sawdust yields deposits with high levels of silicon and aluminium which indicates the presence of ashes with high fusion temperature and, thus, with less capacity to adhere to the surfaces. In contrast, in the co-firing of coal with olive stones the deposition rate increases as compared with the firing of unblended coal and the deposits produced present high levels of potassium, which tend to increase their stickiness. (C) 2010 Elsevier Ltd. All rights reserved.

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