энергии, выброс вредных продуктов сгорания, а также эффективно утилизировать многочисленные промышленные отходы.

Установлено, что с ростом температуры внешней газовой среды отличия инерционности зажигания топлив разных составов минимизируются. Т.е. в режиме стационарной работы котла возможно изменение состава суспензии без существенных изменений характеристик зажигания. Однако для розжига целесообразно использовать суспензии с малыми временами задержки зажигания (например, 20% угольный шлам, 30% фильтр-кек, 50% вода).

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Experimental Investigation of Combustion of Aqueous Fuel Compositions Based on Peat, Coal Slimes and Coal Dust

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The results of experimental studies and comparative analysis of characteristics, limiting conditions and ignition modes of promising aqueous fuel compositions are presented. Peat, coal slime, coal (lignite) and coal flotation waste (filter cake) were used as the main combustible components. Waste turbine oil was used as an additive (10% wt.). We have established the basic characteristics of ignition and combustion of slurries: ignition delay times and droplet burning times, maximum ignition temperatures and maximum combustion temperatures, anthropogenic emissions. The relative efficiency coefficients (taking into account energy, ecological and economic indicators) of fuel slurries were calculated in comparison with coal and fuel oil. It is shown that slurries with a combined composition (with simultaneous use of lignite, coal slime and peat) are the most promising. The total averaged relative efficiency index of the slurries are varied in the range of 1.01–3 (compared to coal) and in the range 2.9–24 (compared to fuel oil). According to the evaluations, the most attractive slurry for combustion at power facilities has the following composition: 30% filter cake, 20% coal slime, 50% water. The efficiency of this fuel is 3 times higher than that of coal and 24 times higher than that of fuel oil. The use of slurries allows reducing the cost of thermal energy, the emission of

harmful combustion products, and also to efficiently dispose numerous industrial wastes.

It was found that when the temperature in the combustion chamber is increased, the differences in ignition delay times are minimized for fuel compositions with a different composition. This means that in the stationary operation mode of the boiler, it is possible to change the composition of the slurry without significant changes in the ignition characteristics. However, for the boiler heating, it is advisable to use slurries with short ignition delay times (for example, the compositions: 1–20% coal slurry, 30% filter cake, 50% water, 2 – 40% coal slime, 10% waste turbine oil, 50% water).

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