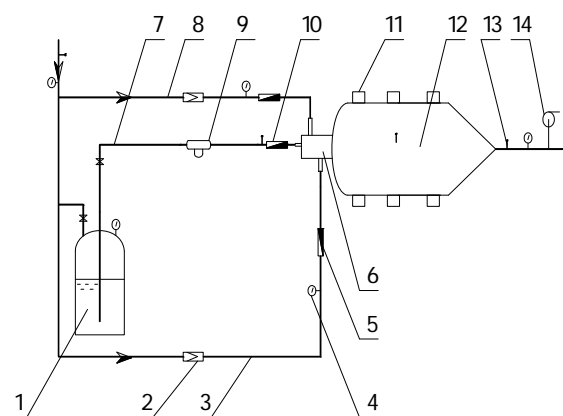


Stability of emulsion from bio-oil and diesel oil and combustion experimental study of emulsion

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By using emulsifiers of Span-80 and Tween-80, the emulsion was prepared by bio-oil and diesel oil. The effect of HLB value and volume fraction of bio-oil on the stability of emulsion was studied. The combustion and gaseous pollutants characteristics of emulsion were also studied in the paper. The results may be summarized as follows: when the volume fraction of bio-oil is not more than 15% and the HLB value is between 7.0 and 8.0, emulsion can remain stable. With the increase of oxygen in flue gas, the combustion temperature and the NOX concentration of emulsion are increased, and the concentrations of SO₂ and CO are decreased. The combustion temperature and the concentrations of SO₂, NOX and CO of emulsion are lower than those of diesel oil at the same flue gas oxygen. Compared with diesel oil flame, the flame of emulsion has higher brightness and the outer edge of flame shows cross-flash phenomenon. Emulsion can be used as an alternative oil fuel, but the questions of lower acidity, larger exhaust heat loss, higher viscosity should be pay more attention.



1.oil tank 2. pressure reducing valve 3. combustion air tube 4. pressure meter 5. air flow meter 6. burner 7. oil pipe 8. atomization air pipe 9. oil filter 10. oil flow meter 11. observation hole 12. horizontal furnace 13. thermocouple 14.flue gas analyzer

Fig.1 Emulsion combustion process

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