FTIR STUDY OF COMUSTION SPECIES IN SEVERAL REGIONS OF A CANDLE FLAME

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The complex chemical structure of the fuel in a candle flame, parafin, is broken down into smaller hydrocarbons in the dark region just above the candle wick during combustion. This creates fuel-rich, fuel-lean, hydrocarbon reaction, and combustion product regions in the flame during combustion that are spectroscopically rich, particularly in the infrared. IR emissions were measured for each reaction region via collection optics focused into an FTIR and used to identify IR active species present in that region and, when possible, temperature of the sampling region. The results of the measurements are useful for combustion reaction modeling as well as for future validation of mass spectroscopy sampling systems.