TIME RESOLVED FTIR ANALYSIS OF COMBUSTION OF AN ETHANOL/ISOPROPANOL MIXTURE IN A COMMERICIAL INTERNAL COMBUSTION ENGINE

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In order to measure infrared (IR) emission from combustion in an internal combustion engine, a small commercial spark ignition engine was modified with a ZnSe optical access window. This modification allows for transmission of IR radiation for time-resolved spectroscopic measurements by a Fourier-Transform IR (FTIR)spectrometer. By using a Step-scan equipped Fourier transform spectrometer, temporally resolved infrared spectral data were acquired and compared for combustion in the modified engine. These measurements provide insight into the energy transfer vectors during the combustion process and also provides an in situ measurement of the progress of combustion (via CO2 production). Measurements were performed using an ethanol and isopropanol mixture to provide additional IR sources to trace during the combustion process.