MID-IR CAVITY RING-DOWN SPECTROMETER FOR BIOLOGICAL TRACE NITRIC OXIDE DETECTION

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S-nitrosothiols have received much attention in biochemistry and medicine as donors of nitrosonium ion (NO^+) and nitric oxide (NO) physiologically active molecules involved in vasodilation and signal transduction. Determination of S-nitrosothiols content in cells and tissues is of great importance for fundamental research and medical applications. We will report on our ongoing development of a instrument to measure trace levels of nitric oxide gas (NO), released from S-nitrosothiols after exposure to UV light (340 nm) or reaction with L-Cysteine+CuCl mixture. The instrument uses the method of cavity ring-down spectroscopy, probing rotationally resolved lines in the vibrational fundamental transition near 5.2 μm. The laser source is a continuous-wave, room temperature external cavity quantum cascade laser. An acousto-optic modulator is used to abruptly turn off the optical power incident on the cavity when the laser and cavity pass through resonance.