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Experiments on interaction of pulsed electron beam controlled discharge (EBCD) CO laser radiation with monoxide molecules excited in EBCD have been carried out. The behaviour of IR radiation absorption coefficient of vibrational nonequilibrium active medium containing CO molecules with respect to optical energy density and to specific input energy in active medium has been experimentally determined. It has been shown that these dependences was nonlinear, that is evidence to some extent of presence of "explossive absorption".

The analisys of probe IR radiation spectrum transformation under it propagation through the active medium has been made. It has been found that not only strong absorption on vibrational bands $V \Rightarrow V-1$ from $4 \Rightarrow 3$ to $8 \Rightarrow 7$ but amplification on highly bands up to $16 \Rightarrow 15$ existed. From spectral meassuring it has been shown that small signal gain on some vibrational-rotational transitions reached the value up to ~ 10^{-2} cm^{-1}.

Under conditions of combined (optical + EBCD) pumping of laser mixture the laser action with specific output energy ~ 5 $J \cdot l^{-1} \cdot atm^{-1}$ has been observed at room temperature of active medium. Under the same conditions of pumping at the temperature of active medium ~ 200 K the laser action on the first overtone of CO molecule (λ ~ 2.7 - 3.3 μ) has been detected.