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High efficient generation of IR beam by SRS of high pressure H₂, D₂ and CH₄

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High efficient generation of IR beam by SRS of high pressure H₂, D₂ and CH₄: Stimulated Raman scattering (SRS) is a very effective method to expand the spectrum range of high power laser, especially in the regime of near IR and middle IR. In this paper, SRS of high pressure H₂, D₂ and CH₄ with multiple-pass cell configuration were reported. By the optimization of experimental parameter, such as the pressure of Raman gas and buffer gas, the number of passes, the radius of focus lens, and the radius of curvature mirror, etc., the best conversion efficiency of the first stokes (S1) and the first stokes (S2) was achieved. The lowest S1 threshold was 0.18 MW, and the best S1 conversion efficiency is up to 75%; the lowest S2 threshold was 2.2 MW, and the best S2 conversion efficiency is up to 34%. By the combination of Raman gases and orders of stokes, lasers with wavelength of 1.54 μm, 1.56 μm, 1.91 μm, 2.80 μm and 2.92 μm were generated. Experimental results also indicated that lasers with wavelength of 9.8 μm and 22.9 μm were generated.

Biography

Jinbo Liu has completed his Doctor degree from Harbin Institute of Technology in 2009 and then worked in the Key Laboratory of Chemical Laser, Dalian Institute of Chemical Physics- CAS. Currently, he is an Associate Professor/Master Director of Chemical Physics.

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