

## REFERENCES

Yasuo Tashiro,  
Excited

1. Peter K. Cheo, "Handbook of Molecular Lasers," *Marcel Dekker, Inc.*, New York, 1987, chap. 1 and 2, pp. 1-164.
2. A. J. Beaulieu, "Transversely Excited Atmospheric Pressure CO<sub>2</sub> Lasers," *Appl. Phys. Lett.*, vol. 16, June 1970, pp. 504-505.
3. Obert R. Wood, "High-Pressure Pulsed Molecular Lasers," *Proc. IEEE*, vol. 62, no. 3, Mar. 1974, pp. 355-397.
4. Jacques A. Beaulieu, "High Peak Power Gas Lasers," *Proc. IEEE*, vol. 59, no. 4, Apr. 1971, pp. 667-674.
5. Alan E. Hill, "Multijoule Pulses from CO<sub>2</sub> Lasers," *Appl. Phys. Lett.*, vol. 12, no. 9, May 1968, pp. 324-327.
6. S. J. Tan, "Investigation of a High Power TEA CO<sub>2</sub> Laser for Marking Purposes," Master of Philosophy dissertation, University of Malaya, 1988. &  
S. J. Tan and K. S. Low, *J. Fiz. Mal.* vol. 9, 1988, pp. 15-18.
7. T. Y. Chang, "Improved Uniform-Field Electrode Profiles for TEA Laser and High-Voltage Applications," *Rev. Sci. Instrum.*, vol. 44, no. 4, Apr. 1973, pp. 405-407.
8. Gerard J. Ernst, "Uniform-Field Electrodes with Minimum Width," *Opt. Commun.*, vol. 49, no. 4, Mar. 1984, pp. 275-277.
9. P. E. Dyer and D. J. James, "Electrical Characteristics of a Double-Discharge TEA CO<sub>2</sub> Laser," *J. Appl. Phys.*, vol. 46, no. 4, Apr. 1975, pp. 1679-1683.
10. Y. Sakai, M. Takahashi, S. Sakamoto, and H. Tagashira, "CO<sub>2</sub> TEA Laser Discharge Development - A High-Speed-Camera Investigation," *J. Appl. Phys.*, vol. 50, no. 2, Feb. 1979, pp. 647-652.
11. G. S. Dzakowic and S. A. Wutzke, "High-Pulse-Rate Glow-Discharge Stabilization by Gas Flow," *J. Appl. Phys.*, vol. 44, no. 11, Nov. 1973, pp. 5061-5063.
12. Paul W. Pace and Marc Lacombe, "A Sealed High-Repetition-Rate TEA CO<sub>2</sub> Laser," *IEEE J. Quantum Electron.*, vol. QE-14, no. 4, Apr. 1978, pp. 263-274.

13. Hirokazu Hokazono, Minoru Obara, Katsumi Midorikawa, and Hideo Tashiro, "Theoretical Operational Life Study of the Closed-Cycle Transversely Excited Atmospheric CO<sub>2</sub> Laser," *J. Appl. Phys.*, vol. 69, no. 10, May 1991, pp 6850-6868.
14. Hirokazu Hokazono and Haruo Fujimoto, "Theoretical Analysis of the CO<sub>2</sub> Molecule Decomposition and Contaminants Yield in Transversely Excited Atmospheric CO<sub>2</sub> Laser Discharge," *J. Appl. Phys.*, vol. 62, no. 5, Sept. 1987, pp. 1585-1594.
15. Hideo Tashiro, Akira Suda, Masashi Kurachi, Setsuo Shibata, Masami Toshikuni, Masatoshi Maki, and Katsumi Midorikawa, "Gas Degradation and O<sub>2</sub> Production in a High Repetition Rate, Transversely Excited Atmospheric CO<sub>2</sub> Laser," *J. Appl. Phys.*, vol. 71, no. 4, Feb. 1992, pp. 2025-2027.
16. William L. Nighan, W. J. Wiegand, and Roger A. Haas, "Ionization Instability in CO<sub>2</sub> Laser Discharges," *Appl. Phys. Lett.*, vol. 22, no. 11, June 1973, pp. 579-582.
17. D. H. Douglas-Hamilton and Siva A. Mani, "An Electron Attachment Plasma Instability," *Appl. Phys. Lett.*, vol. 23, no. 9, Nov. 1973, pp. 508-510.
18. Edmond Y. Chu and Anthony Trippe, "Power Conditioning Improves Performance of Discharge Lasers," *Laser Focus World*, vol. 28, no. 2, Feb. 1992, pp. 127-134.
19. A. H. Bushnell, M. Gundersen, and T. R. Burkes, "Effect of a Small Capacitor in Parallel with a Pulsed CO<sub>2</sub> TEA Laser," *IEEE J. Quantum Electron.*, vol. QE-12, July 1976, p. 477.
20. P. A. Atanasov, M. D. Petrova, and M. Grodel, "Effect of Peaking Capacitor on the Discharge Characteristics and Output Parameters of TE CO<sub>2</sub> Lasers," *Opt. Quantum Electron.*, vol. 13, 1981, pp. 251-253.
21. F. Encinas Sanz and J. M. Guerra Pérez, "Peaking Capacitor in an Incomplete Corona Surface Discharge Preionized TEA CO<sub>2</sub> Laser," *IEEE J. Quantum Electron.*, vol. 27, no. 4, Apr. 1991, pp. 891-894.
22. John Tulip, Herb J. Seguin, and Wayne Faszer, "High-Repetition-Rate TEA-Laser Discharge Using Integrated Preionization and Switching," *IEEE J. Quantum Electron.*, vol. QE-12, no. 2, Feb. 1976, pp. 155-159.

23. Hirokazu Hokazono, Naoki Kobayashi, Minoru Obara, Katsumi Midorikawa, and Hideo Tashiro, "Plasma Chemistry of the Closed-Cycle 1kHz Transversely Excited Atmospheric CO<sub>2</sub> Laser with an Efficient Catalytic CO<sub>2</sub> Regenerator," *IEEE J. Quantum Electron.*, vol. 28, no. 8, Aug. 1992, pp. 1792-1797.
24. K. Guinn, S. Goldblum, E. Noskowski and R. Herz, "Design of CO-O<sub>2</sub> Recombination Catalysts for Closed-Cycle CO<sub>2</sub> Lasers," in *Proc. SPIE*, vol. 1062: Laser Applications in Meteorology and Earth and Atmospheric Remote Sensing, 1989, pp. 130-137.
25. K. Yasuoka, A. Ishii, T. Tamagawa, and I. Oshima, "A Newly Developed Excitation Circuit for kHz Pulsed Lasers," in *Proc. SPIE*, vol. 1412: Gas and Metal Vapor Lasers and Applications, 1991, pp. 32-37.
26. Hiroshi Tanaka, Hidekazu Hatanaka, and Minoru Obara, "High-Efficiency, All-Solid-State Exciters for High-Repetition-Rated, High-Power TEA CO<sub>2</sub> Lasers," *Rev. Sci. Instrum.*, vol. 61, no. 8, Aug. 1990, pp. 2092-2096.
27. A. Sylvan, G. D. Spiers, A. Johnstone, and R. G. Harrison, "Compact High Repetition Rate Magnetically Switched Transverse, Electric Atmospheric CO<sub>2</sub> Laser," *Rev. Sci. Instrum.*, vol. 61, no. 7, July 1990, pp. 1821-1824.
28. Tsutomu Shimada, Kohji Noda, Minoru Obara, and Katsumi Midorikawa, "Pulsed CO<sub>2</sub> Laser Pumped by an All Solid-State Magnetic Exciter," *Japan. J. Appl. Phys.*, vol. 24, no. 11, Nov. 1985, pp. L855-L857.
29. K.R. Rickwood and J. Molnnes, "High Repetition Rate Mini TEA CO<sub>2</sub> Laser Using a Semiconductor Preionizer," *Rev. Sci. Instrum.*, vol. 53, no. 11, Nov. 1982, pp. 1667-1669.
30. Robert T. Brown, "Mini-TEA 1000-Hz CO<sub>2</sub> Laser," *Appl. Opt.*, vol. 23, no. 15, Aug. 1984, pp. 2485-2487.
31. W. S. Melville, "The Use of Saturable Reactors as Discharge Devices for Pulse Generators," *Proc. IEE*, vol. 98, part 3, no. 53, London, 1951, pp. 185-207.

32. S. Spencer Merz and Martin A. Gundersen, "Switch Developments Could Enhance Pulsed-Laser Performance," *Laser Focus/Electro-Optics*, vol. 24, no. 5, May 1988, pp. 70-78.
33. G. Meehtersheimer, R. Kohler, T. Lasser and R. Meyer, "High Repetition Rate, Fast Current Rise, Pseudo-Spark Switch," *J. Phys. E: Sci. Instrum.*, vol. 19, 1986, pp. 466-470.
34. F. E. Peterkin and P. F. Williams, "Physical Mechanism of Triggering in Trigatron Spark Gaps," *Appl. Phys. Lett.*, vol. 53, no. 3, July 1988, pp. 182-184.
35. Frank B. A. Früngel, "High Speed Pulse Technology: Volume I," *Academic Press*, New York, 1965, pp. 113-171.
36. J. D. Craggs and J. M. Meek, "High Voltage Laboratory Technique," *Butterworths Scientific Publications*, London, 1954, chap. 6, pp. 175-202.
37. T. Y. Tou, K. S. Low, and B. C. Tan, "A Simple Two-Stage Cascading Spark Gap for Ultraviolet Preionized Transversely Excited Atmospheric CO<sub>2</sub> Laser," *Rev. Sci. Instrum.*, vol. 62, no. 11, Nov. 1991, pp. 2584-2587.
38. T. Y. Tou, W. S. Seow, W. O. Siew, K. W. Beak, Y. H. Chen, and K. S. Low, "Air Breakdown Times of Two-Stage Spark Gaps and Their Applications," *IEEE Trans. Plasma Sci.*, vol. 21, no. 6, Dec. 1993, pp. 696-700.
39. M. Michon et al.: *Appl. Opt.*, vol. 11, no. 8, Aug. 1972, p. 1891.
40. R. Dumanchin, M. Michon, J. C. Farcy, G. Boudinet, and J. Rocca-Serra, "Extension of TEA CO<sub>2</sub> Laser Capabilities," *IEEE J. Quantum Electron.*, vol. QE-8, no. 2, Feb. 1972, pp. 163-165.
41. D. C. Hamilton, D. J. James, and S. A. Ramsden, "A Repetitively Pulsed, Double Discharge TEA CO<sub>2</sub> Laser," *J. Phys. E: Sci. Instrum.*, vol. 8, 1975, pp. 849-852.
42. N. Menyuk and P. F. Moulton, "Development of a High-Repetition-Rate Mini-TEA CO<sub>2</sub> Laser," *Rev. Sci. Instrum.*, vol. 51, no. 2, Feb. 1980, pp. 216-220.
43. P. E. Dyer and B. L. Tait, "Miniature 250 Hz, TEA CO<sub>2</sub> Laser Using H<sub>2</sub> Buffered Gas Mixture," *J. Phys. E: Sci. Instrum.*, vol. 16, 1983, pp. 467-469.

44. D. S. Stark, A. Crocker, and G. J. Steward, "A Sealed 100-Hz CO<sub>2</sub> TEA Laser Using High CO<sub>2</sub> Concentrations and Ambient-Temperature Catalysts," *J. Phys. E: Sci. Instrum.*, vol. 16, 1983, pp. 158-161.
45. S. Howells, J. V. Cridland, and R. H. Derrick, "A Medium PRF UV Preionised TEA CO<sub>2</sub> Laser," *J. Phys. E: Sci. Instrum.*, vol. 14, 1981, pp. 293-295.
46. Renato Marchetti, Eugenio Penco, and Gianemilio Salvetti, "Sealed, Miniaturized, Corona-Preionized, High-Repetition-Rate TEA CO<sub>2</sub> Laser Using Hydrogen Buffered Gas Mixtures," *IEEE J. Quantum Electron.*, vol. QE-21, no. 11, Nov. 1985, pp. 1766-1771.
47. Katsumi Midorikawa and Hideo Tashiro, "High Power Midinfrared Gas Lasers," in *Proc SPIE*, vol. 1225: High Power Gas Lasers, 1990, pp. 324-329.
48. C. Baker, P. E. Dyer, and B. L. Tait, "Design of a Compact High PRF TEA CO<sub>2</sub> Laser and Performance under Multimode and Single Mode Conditions," *J. Phys. E: Sci. Instrum.*, vol. 14, 1981, pp. 1167-1170.
49. Masakatsu Sugii, Takao Komi, Hiroshi Hara, and Hiromichi Shirahata, "High-Power, Tunable, High-Repetition-Rate TEA-<sup>13</sup>C<sup>18</sup>O<sub>2</sub> Laser," *IEEE J. Quantum Electron.*, vol. 28, no. 8, Aug. 1992, pp. 1754-1755.
50. P. E. Dyer and P Monk, "A Repetitively Pulsed Sealed-TE CO<sub>2</sub> Laser Using an Oxygen Tolerant Discharge Scheme," *Appl. Phys. B*, vol. 26, 1981, pp. 169-172.
51. B. Norris and A. L. S. Smith, "Compact Sealed Photopreionized TEA CO<sub>2</sub> Laser Without Heterogeneous Catalysis or Gas Recycling," *Appl. Phys. Lett.*, vol. 34, no. 6, Mar. 1979, pp. 385-386.
52. J. V. Cridland and S. Howells, "The Dependence of Transversely Excited Atmospheric CO<sub>2</sub> Laser Performance on Circuit Configuration," *J. Appl. Phys.*, vol. 53, no. 6, June 1982, pp. 4016-4019.
53. H. Houtman, A. Cheuck, A. Y. Elezzabi, J. E. Ford, M. Laberge, W. Liese, J. Meyer, G. C. Stuart, and Y. Zhu, "High-Speed Circuits for TE Discharge Lasers and High-Voltage Applications," *Rev. Sci. Instrum.*, vol. 64, no. 4, Apr. 1993, pp. 839-853.

54. Koji Matsumoto, Kazuhiko Sueoka, Minoru Obara, and Tomoo Fujioka, "A UV-Preionized High-Repetition-Rate TEA CO<sub>2</sub> Laser," *Japan. J. Appl. Phys.*, vol. 19, no. 10, Oct. 1980, pp. 1959-1968.
55. Yutaka Uchida, Shinji Oukuma, Saburo Sato, and Tatsumi Goto, "Effects of H<sub>2</sub> and CO Additives on the O<sub>2</sub> Accumulation in the TEA CO<sub>2</sub> Laser," *Japan. J. Appl. Phys.*, vol. 29, no. 7, July 1990, pp. 1266-1269.
56. J. J. Lowke, A. V. Phelps, and B. W. Irwin, "Predicted Electron Transport Coefficients and Operating Characteristics of CO<sub>2</sub>-N<sub>2</sub>-He Laser Mixtures," *J. Appl. Phys.*, vol. 44, no. 10, Oct. 1973, pp. 4664-4671.
57. A. Chakrabarti and J. Reid, "Long-Pulse Transversely Excited <sup>12</sup>CO<sub>2</sub> and <sup>13</sup>CO<sub>2</sub> Lasers," *J. Appl. Phys.*, vol. 66, no. 1, July 1989, pp. 37-42.
58. M. R. Harris and D. V. Willetts, "Transversely Excited CO<sub>2</sub> Laser with Long Pulse Duration Discharge," *Opt. Commun.*, vol. 83, no. 3,4, June 1991, pp. 227-230.
59. Laurence E. Kline and L. J. Denes, "Investigations of Glow Discharge Formation with Volume Preionization," *J. Appl. Phys.*, vol. 46, no. 4, Apr. 1975, pp. 1567-1574.
60. P. K. Bhadani, A. Sylvan, and R. G. Harrison, "Efficient Switchless Multi-Joule TE-CO<sub>2</sub> Laser," *Rev. Sci. Instrum.*, vol. 62, no. 6, June 1991, pp. 1404-1407.
61. P. K. Bhadani, A. Sylvan, and R. G. Harrison, "Efficient Helium-Free Multi-Joule TE-CO<sub>2</sub> Laser Using Spiker-Sustainer Excitation," *Rev. Sci. Instrum.*, vol. 63, no. 1, Jan. 1992, pp. 71-74.
62. A. Sylvan, P. K. Bhadani, and R. G. Harrison, "Small Solid-State Switched Pulser-Sustainer TEA CO<sub>2</sub> laser," *Meas. Sci. Technol.*, vol. 2, 1991, pp. 49-53.
63. A. Sylvan, P. K. Bhadani, and R. G. Harrison, "A Solid-State Switched Small TEA CO<sub>2</sub> Laser," *Meas. Sci. Technol.*, vol. 2, 1991, pp. 342-345.
64. C. A. Fenstermacher, M. J. Nutter, W. T. Leland, and K. Boyer, "Electron-Beam-Controlled Electrical Discharge as a Method of Pumping Large Volumes of CO<sub>2</sub> Laser Media at High Pressure," *Appl. Phys. Lett.*, vol. 20, Jan. 1972, pp. 56-60.

65. D. S. Stark, A. Crocker, and N. A. Lowde, "A Semiconductor-Preionised Sealed TEA Laser Operating at High CO<sub>2</sub> Concentrations and Repetition Rates up to 100 Hz," *J. Phys. E: Sci. Instrum.*, vol. 16, 1983, pp. 1069-1071.
66. G. D. Spiers, A. Vass and R. G. Harrison, "The Effect of Sliding Spark, Corona and Semiconductor Pre-ionisers on the Operation and Output of a TEA CO<sub>2</sub> Laser," *Opt. Commun.*, vol. 62, no. 4, May 1987, pp. 256-258.
67. W. J. Witteman, "The CO<sub>2</sub> Laser," Springer Series in Optical Sciences, vol. 53, *Springer-Verlag*, Berlin, 1987, chap. 2, 3, and 6, pp. 8-80, 138-194.
68. W. W. Duley, "CO<sub>2</sub> Lasers: Effects and Applications," *Academic Press*, New York, 1976, chap. 2, pp. 15-72.
69. Kenneth Smith and R. M. Thomson, "Computer Modelling of Gas Lasers," *Plenum Press*, New York, 1978, chap. 2, p. 28.
70. Blake E. Cherrington, "Gaseous Electronics and Gas Lasers," International Series in Natural Philosophy, vol. 94, *Pergamon Press*, Oxford, 1979, chap. 3 and 12, pp. 20-48, 210-253.
71. D. C. Tyte, "Carbon Dioxide Lasers," *Advances in Quantum Electronics*, vol. 1, *Academic Press*, London, 1970, pp. 129-198.
72. G. Herziger, R. Wollermann-Windgasse, and K. H. Banse, "On the Homogeneization of Transverse Gas Discharges by Preionization," *Appl. Phys.*, vol. 24, 1981, pp. 267-272.
73. Jeffrey I. Levatter and Shao-Chi Lin, "Necessary Conditions for the Homogeneous Formation of Pulsed Avalanche Discharges at High Gas Pressures," *J. Appl. Phys.*, vol. 51, no. 1, Jan. 1980, pp. 210-222.
74. A. Jay Palmer, "A Physical Model on the Initiation of Atmospheric-Pressure Glow Discharges," *Appl. Phys. Lett.*, vol. 25, no. 3, Aug. 1974, pp. 138-140.
75. P. T. Gavrilov, J. Limpouch, G. Lončar, K. Mašek, and M. Vrbová, "Necessary Conditions for the Formation of Self-Sustained Discharge in TEA CO<sub>2</sub> Lasers," *J. Phys. E: Sci. Instrum.*, vol. 20, 1987, pp. 906-910.

76. T. Yokoyama, M. Kogoma, T. Moriwaki, and S. Okazaki, "The Mechanism of the Stabilisation of Glow Plasma at Atmospheric Pressure," *J. Phys. D: Appl. Phys.*, vol. 23, 1990, pp. 1125-1128.
77. W. S. Seow, "Theoretical and Experimental Investigation of High Power TEA-CO<sub>2</sub> Laser," Master of Philosophy dissertation, University of Malaya, 1993.
78. L. J. Denes and J. J. Lowke, "V-I Characteristics of Pulsed CO<sub>2</sub> Laser Discharges," *Appl. Phys. Lett.*, vol. 23, no. 3, Aug. 1973, pp. 130-132.
79. S. Howells and J. V. Cridland, "Performance of a Transverse Electric Atmospheric CO<sub>2</sub> Laser with High Levels of O<sub>2</sub> Contamination," *J. Appl. Phys.*, vol. 53, no. 7, July 1982, pp. 5323-5326.
80. S. Howells and J. V. Cridland, "The Effect of Circuit Inductance on the Operation of a TEA CO<sub>2</sub> Laser," *J. Phys. E: Sci. Instrum.*, vol. 15, 1982, pp. 542-527.
81. J. Mellis and A. L. S. Smith, "Gain Limitations in CO<sub>2</sub> Lasers," *Opt. Commun.*, vol. 41, no. 2, Mar. 1982, pp. 121-125.
82. A. L. S. Smith and J. Mellis, "Operating Efficiencies in Pulsed Carbon Dioxide Lasers," *Appl. Phys. Lett.*, vol. 41, no. 11, Dec. 1982, pp. 1037-1039.
83. V. Yu. Baranov, V. V. Breev, D. D. Malyuta, and V. G. Niz'ev, "Limits on Pulse Repetition Frequency in Periodically Operated CO<sub>2</sub> Lasers," *Sov. J. Quantum Electron.*, vol. 7, no. 9, Sept. 1977, pp. 1059-1062.
84. V. Yu. Baranov, S. A. Kazakov, D. D. Malyuta, V. S. Mezhevov, A. P. Napartovich, V. G. Nisiev, M. Yu. Orlov, A. I. Starodubtsev, and A. N. Starostin, "Average Power Limitations in High-Repetition-Rate Pulsed Gas Lasers at 10.6 and 16  $\mu\text{m}$ ," *Appl. Opt.*, vol. 19, no. 6, Mar. 1980, pp. 930-936.
85. D. S. Stark and A. Crocker, "A Sealed, High-CO<sub>2</sub> High-PRF Semiconductor-Preionised TEA Laser Without a Solid Catalyst," *Opt. Commun.*, vol. 48, no. 5, Jan. 1984, pp. 337-342.



86. Hirokazu Hokazono, Naoki Kobayashi, and Minoru Obara, "Catalytic Control Requirements for the Stable Operation of the Closed-Cycle, Transversely Excited Atmospheric CO<sub>2</sub> Laser," *J. Appl. Phys.*, vol. 70, no. 4, Aug. 1991, pp. 1962-1965.
87. H. Shields, A. L. S. Smith and B. Norris, "Negative Ion Effects in TEA CO<sub>2</sub> Lasers," *J. Phys. D: Appl. Phys.*, vol. 9, 1976, pp. 1587-1603.
88. A. L. S. Smith and J. M. Austin, "Dissociation Mechanism in Pulsed and Continuous CO<sub>2</sub> Lasers," *J. Phys. D: Appl. Phys.*, vol. 7, 1974, pp. 314-322.
89. Yoshiro Ohwadano and Tadashi Sekiguchi, "Development and Performance Characteristics of a UV-Preionized, High-Power TEA Pulsed CO<sub>2</sub>-Laser," *Japan. J. Appl. Phys.*, vol. 19, no. 8, Aug. 1980, pp. 1493-1504.
90. Herb J. Seguin, J. Tulip, and Don C. Mcken, "Ultraviolet Photoionization in TEA Lasers," *IEEE J. Quantum Electron.*, vol. QE-10, Mar. 1974, pp. 311-319.
91. E. William Rapp, "Design Your Cooling System For Good Laser Performance," *Laser Focus/Electro-Optics*, vol. 24, no. 9, Sept. 1988, pp. 65-70.
92. D. S. Ong, "Investigation of the Discharge Kinetics in a KrF Laser," Master of Philosophy dissertation, University of Malaya, 1995.