SUPPLEMENTARY MATERIAL

WITH

MECHANISTIC FEATURES OF ULTRASOUND-ASSISTED OXIDATIVE DESULFURIZATION OF LIQUID FUELS

Manohar Kumar Bolla[1], Hanif A. Choudhury[2] and Vijayanand S. Moholkar[1,2,*]
[1] Department of Chemical Engineering; [2] Center for Energy
Indian Institute of Technology Guwahati
Guwahati – 781 039, Assam, INDIA

* Author for correspondence. E-mail: vmoholkar@iitg.ernet.in. Fax: +91 361 258 2291

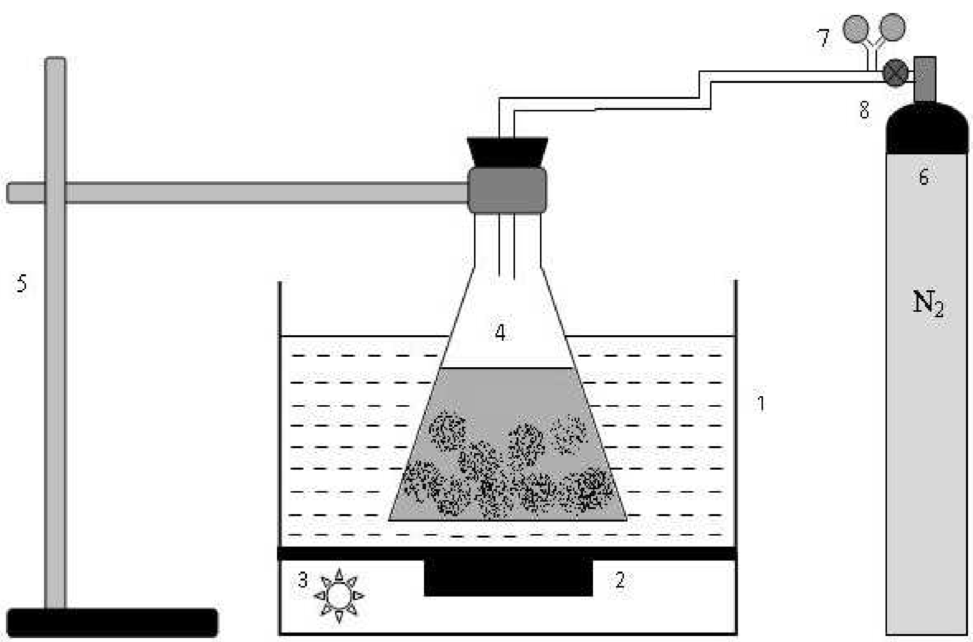

Figure A.1. A schematic diagram of experimental setup, (1) ultrasound bath (2) transducer (3) timer or regulator (4) desorption mixture (5) burette stand to hold the flask (6) nitrogen gas cylinder (7) pressure gauge (8) regulator to control the pressure.

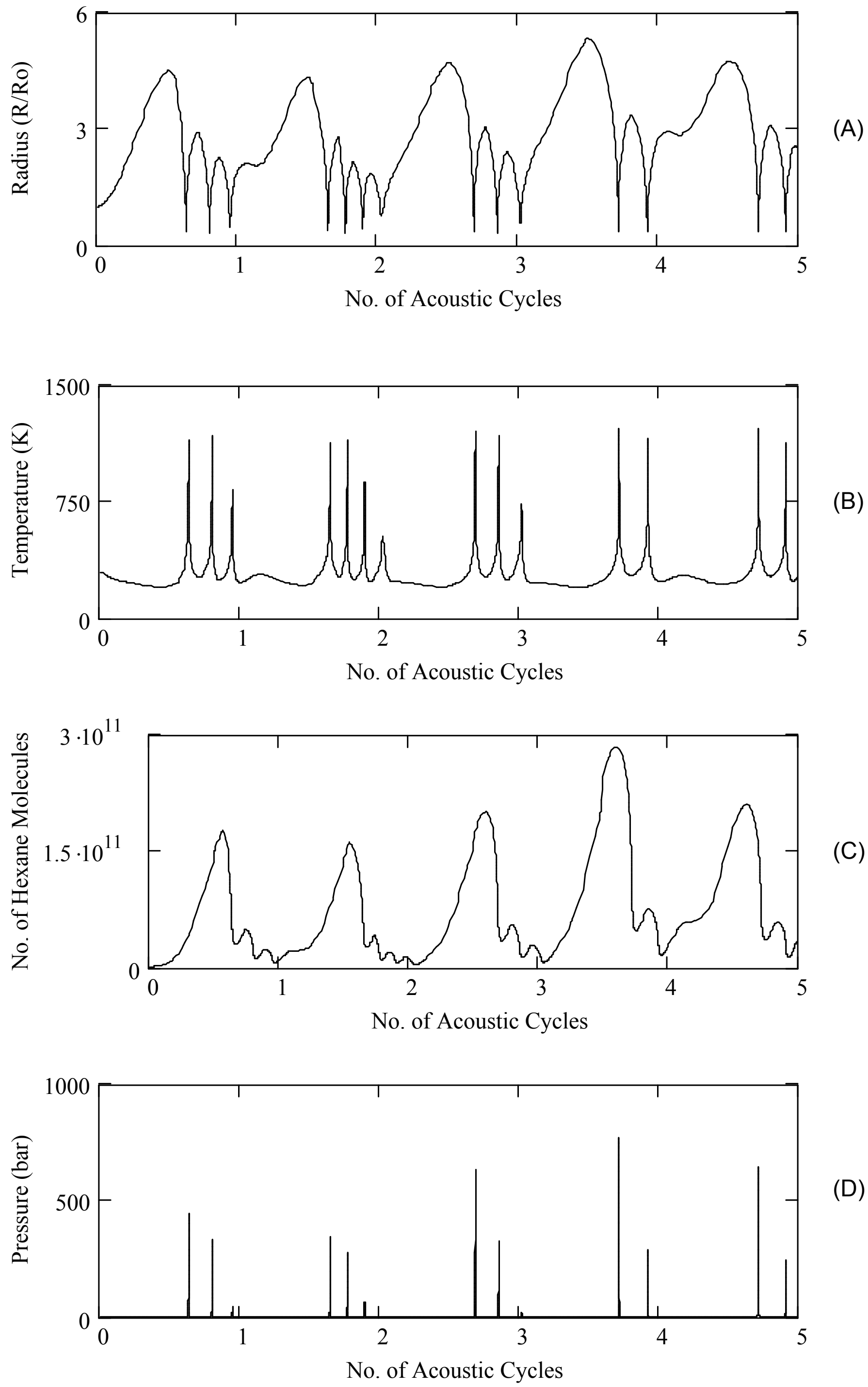

Figure A.2. Simulations of radial motion of a 5 micron air bubble in n-hexane. Ultrasound frequency: 35 kHz; Ultrasound pressure amplitude: 1.3 bar; Ambient pressure: 1 bar (atmospheric). Time history of (A) radius of the bubble; (B) temperature inside the bubble; (C) n-hexane vapor evaporation in the bubble; (D) pressure inside the bubble.

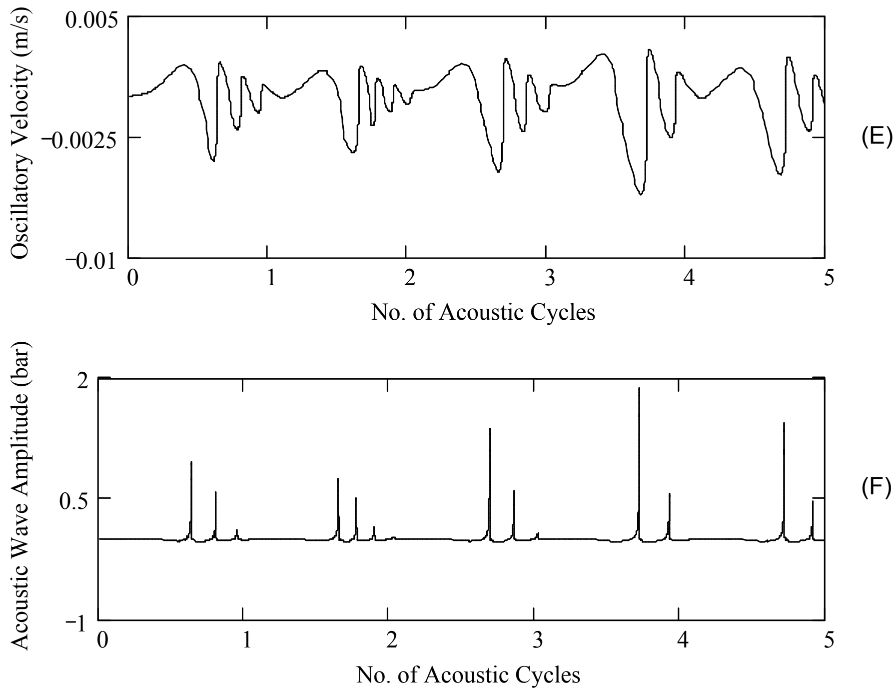

Figure A.2 (continued….). (E) microturbulence generated by the bubble; (F) acoustic waves emitted by the bubble.

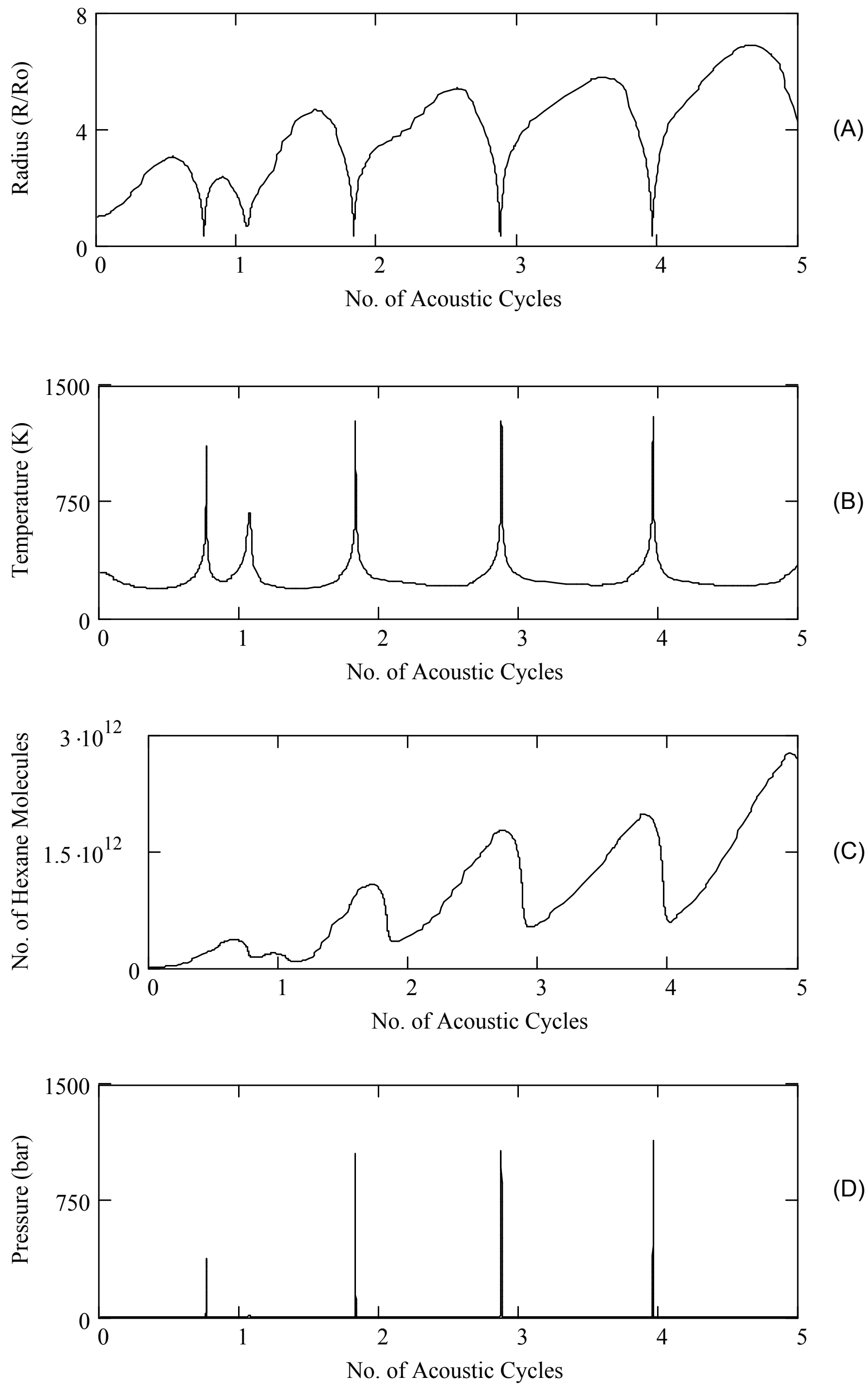

Figure A.3. Simulations of radial motion of a 10 micron air bubble in n-hexane. Ultrasound frequency: 35 kHz; Ultrasound pressure amplitude: 1.3 bar; Ambient pressure: 1 bar (atmospheric). Time history of (A) radius of the bubble; (B) temperature inside the bubble; (C) n-hexane vapor evaporation in the bubble; (D) pressure inside the bubble.

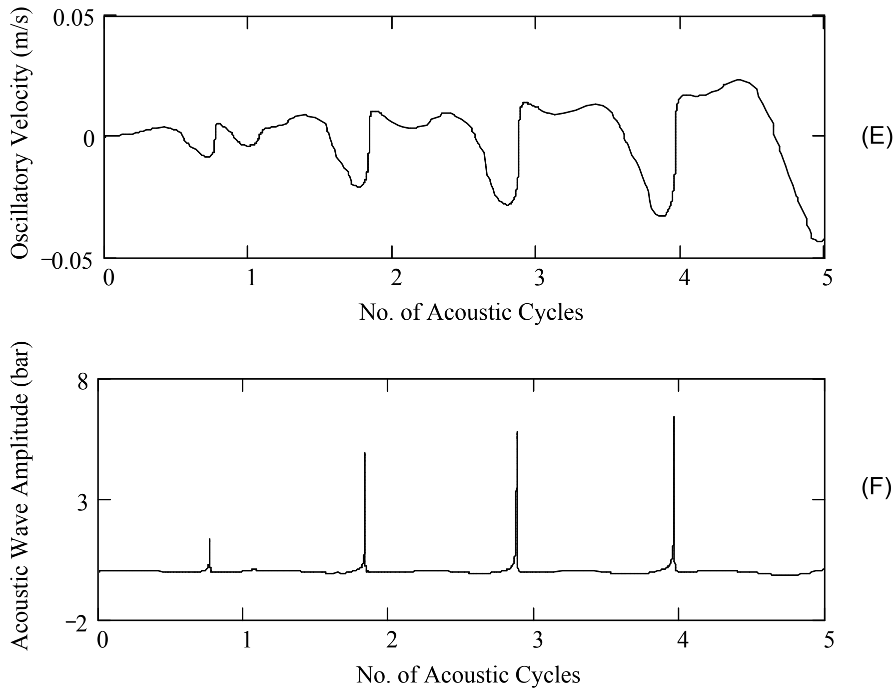

Figure A.3 (continued….). (E) microturbulence generated by the bubble; (F) acoustic waves emitted by the bubble.

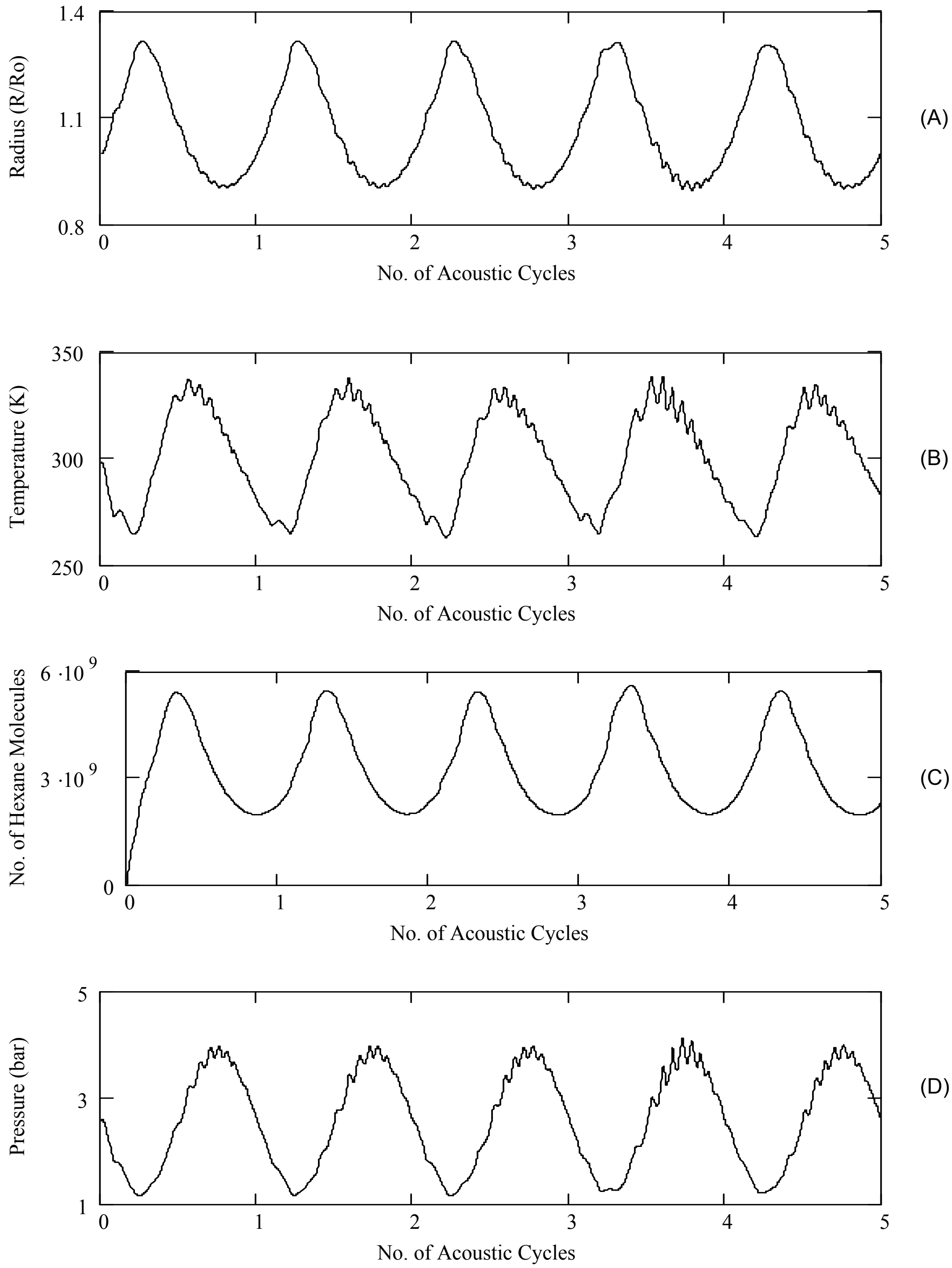

Figure A.4. Simulations of radial motion of a 5 micron air bubble in n-hexane. Ultrasound frequency: 35 kHz; Ultrasound pressure amplitude: 1.3 bar; Ambient pressure: 2.5 bar (elevated). Time history of (A) radius of the bubble; (B) temperature inside the bubble; (C) n-hexane vapor evaporation in the bubble; (D) pressure inside the bubble.

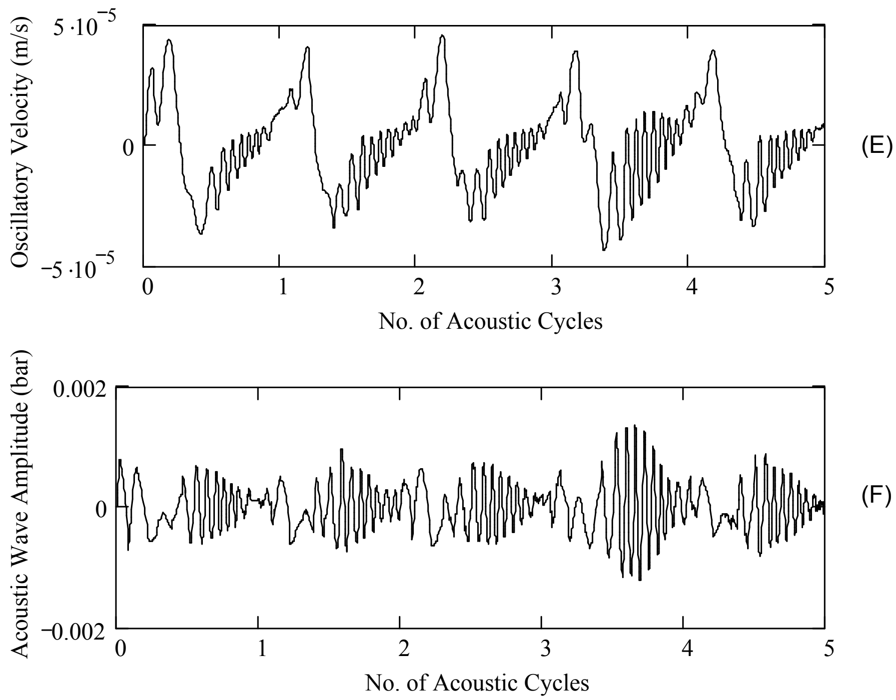

Figure A.4 (continued….). (E) microturbulence generated by the bubble; (F) acoustic waves emitted by the bubble.

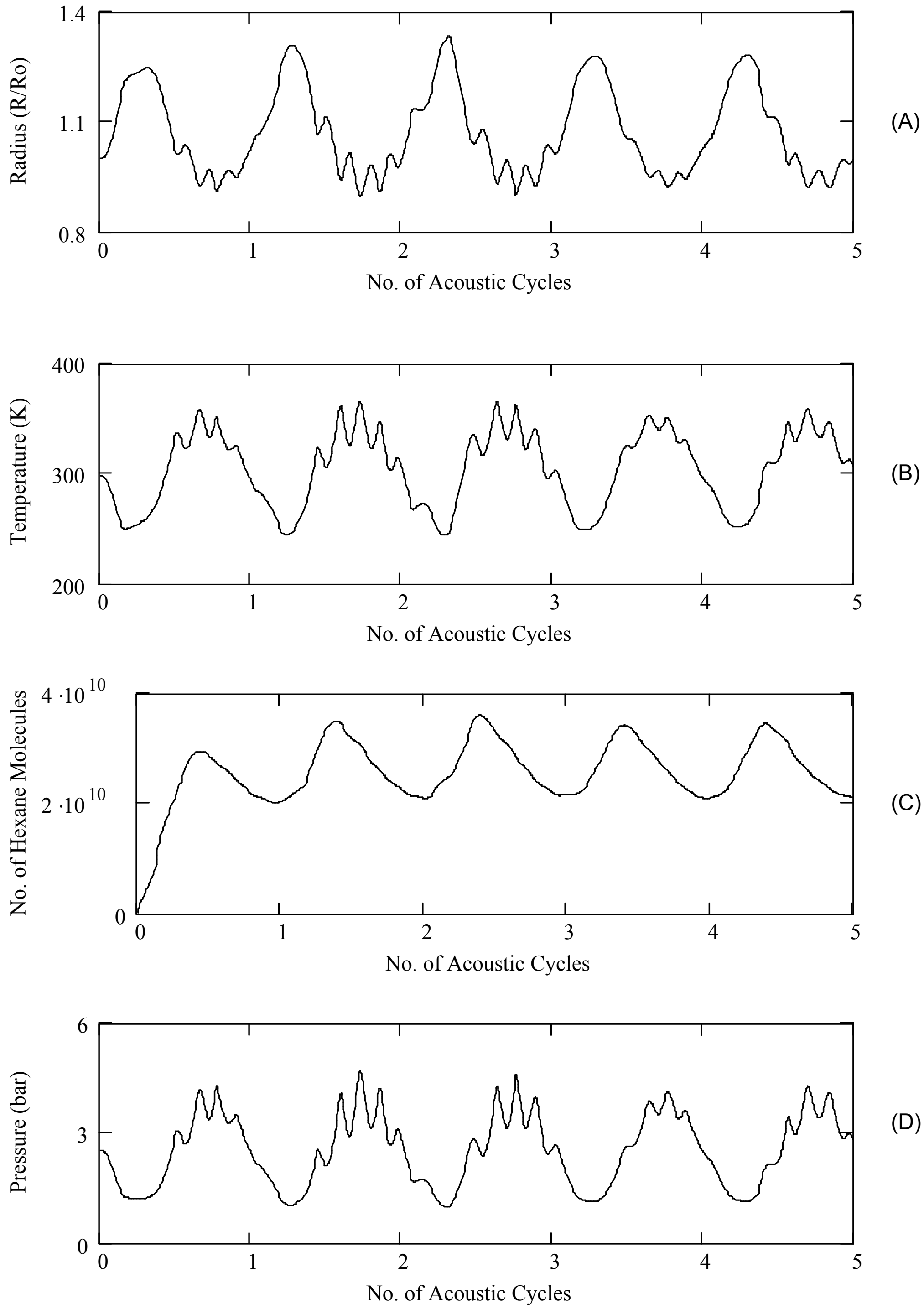

Figure A.5. Simulations of radial motion of a 10 micron air bubble in n-hexane. Ultrasound frequency: 35 kHz; Ultrasound pressure amplitude: 1.3 bar; Ambient pressure: 2.5 bar (elevated). Time history of (A) radius of the bubble; (B) temperature inside the bubble; (C) n-hexane vapor evaporation in the bubble; (D) pressure inside the bubble.

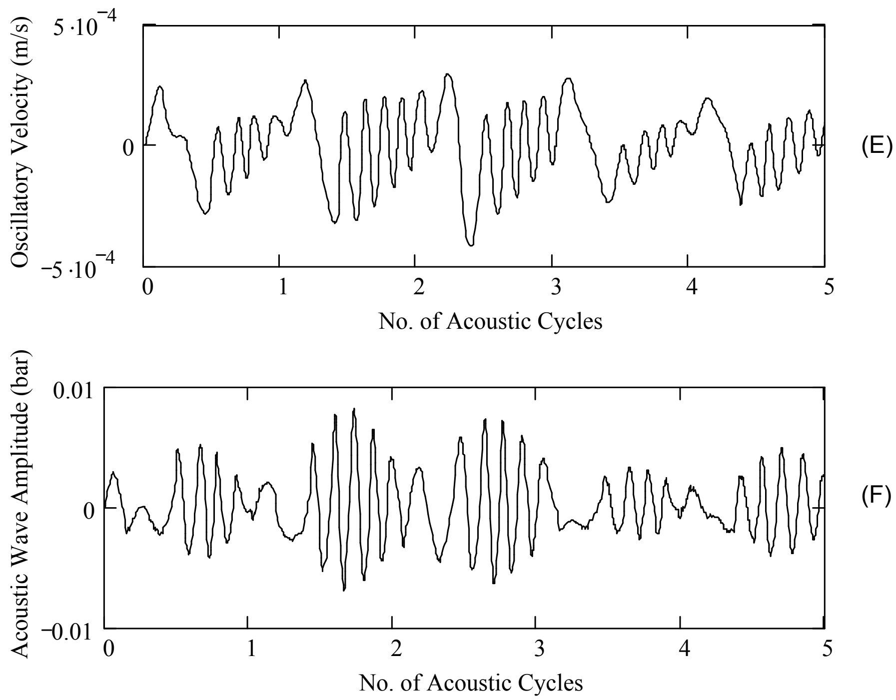

Figure A.5 (continued….). (E) microturbulence generated by the bubble; (F) acoustic waves emitted by the bubble.