



INTERNATIONAL ATOMIC ENERGY AGENCY
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WINTER COLLEGE ON

ATOMIC AND MOLECULAR PHYSICS

(9 March - 3 April 1987)

(ANALYTICAL LASER SPECTROSCOPY 1)

Atomizers, Atomization Processes,
Flame, Inductively Coupled Plasma, Furnace

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“ANALYTICAL
LASER
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I.



Atomizers



Atomization Processes



Flame, Inductively Coupled Plasma,
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ATOMIC ANALYSIS

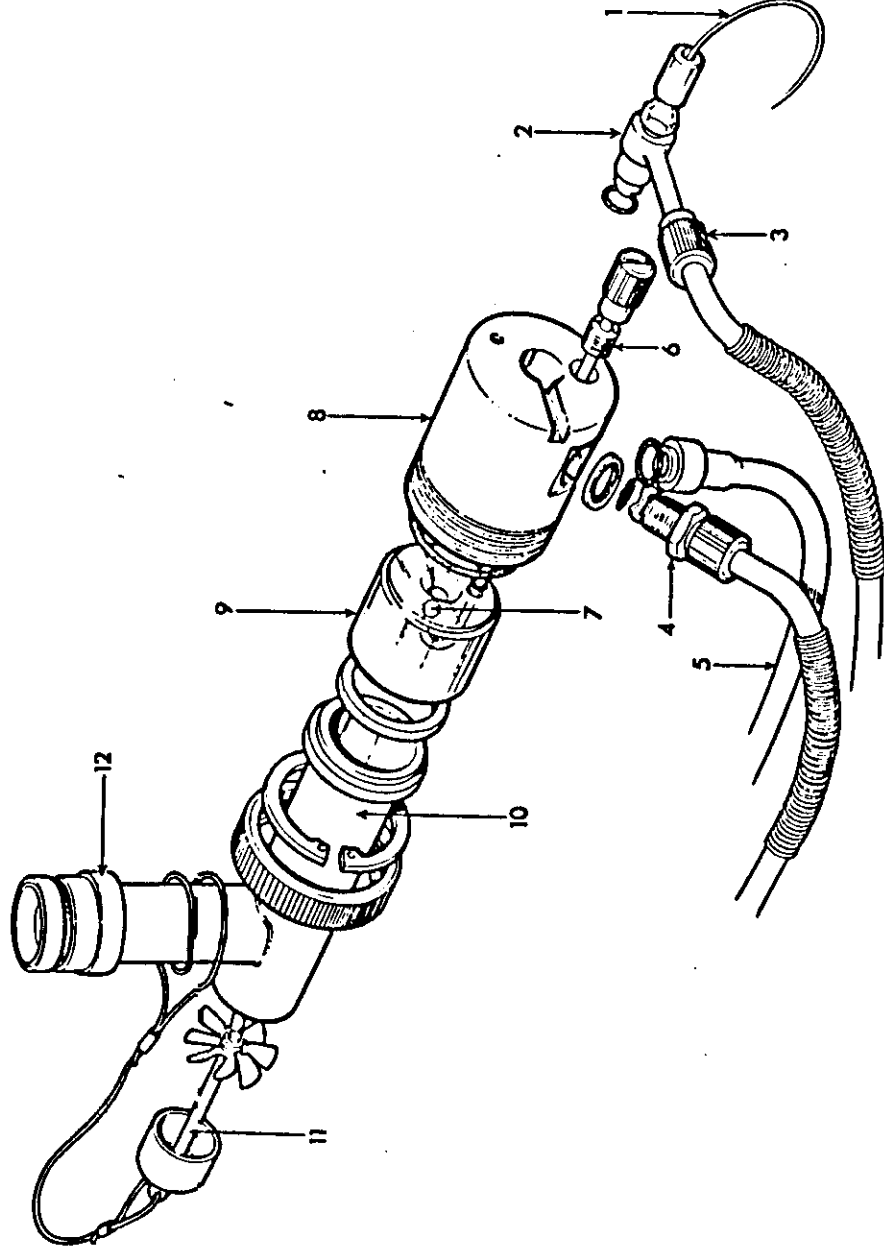
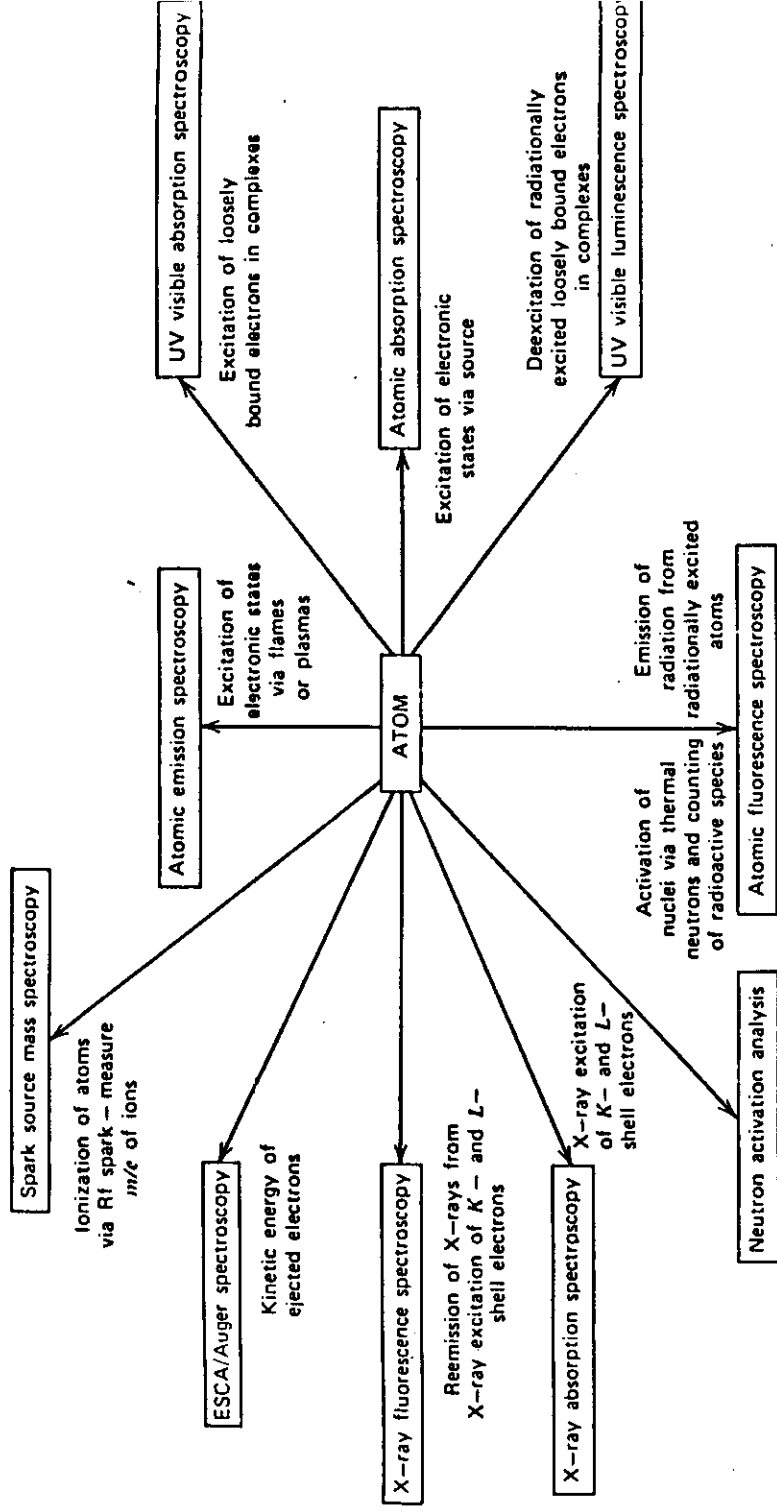


FIG. 9. Sampling unit (from Unicam SP1900). 1. Sample uptake capillary; 2. Nebulizer; 3. Oxidant inlet; 4. Fuel inlet; 5. Drain; 6. Bead holder; 7. Impact bead; 8. Steel protective body; 9. Inert insert; 10. Spray chamber; 11. Baffle and safety bung; 12. Burner stem.

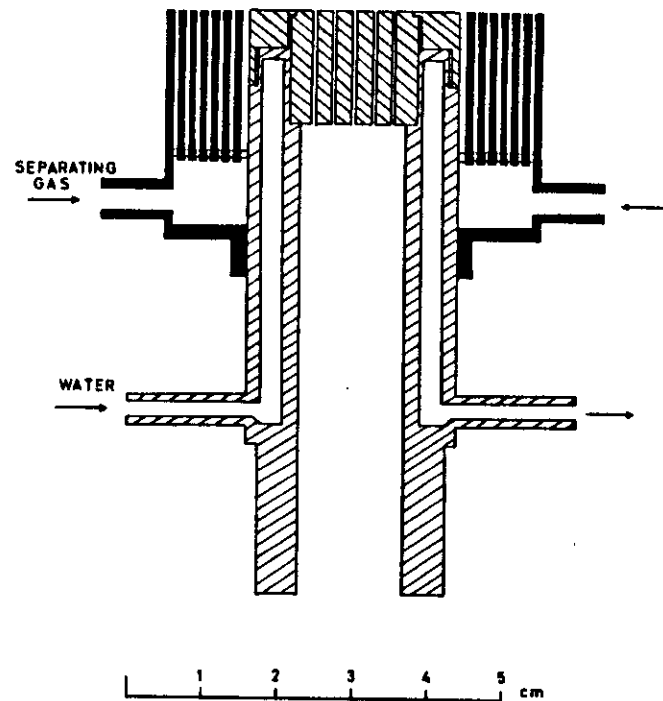


Fig. 1: Cutaway sketch of the burner

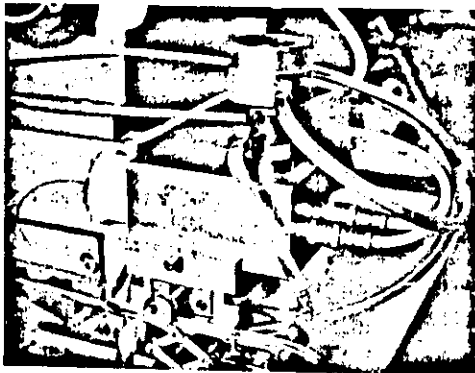


Fig. 2: View of the burner assembly

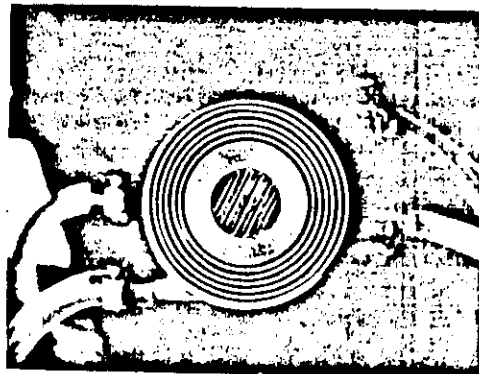
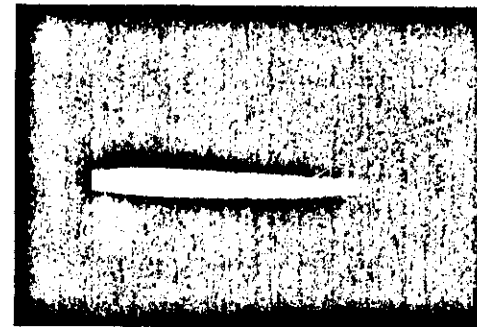
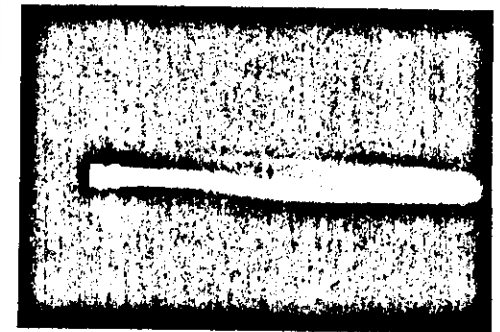
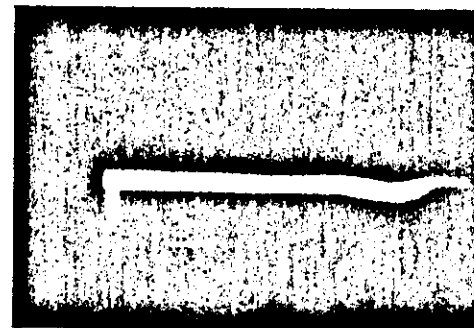
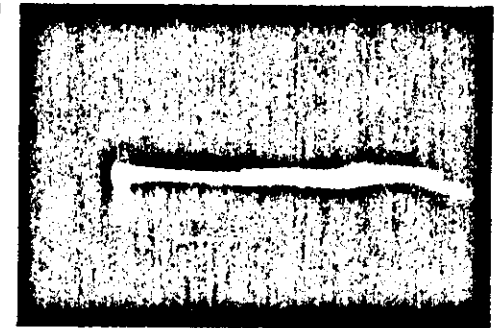


Fig. 3: Front view of the burner head surrounded by the flame separator

Fig. 4: Appearance of the normal Air/C₂H₄ flame fed with Lithium saltsFig. 5: Effect of N₂ separation on the flame of Fig. 4. The lifting of the secondary reaction zone and the permanence of the emitting atoms in the interconal zone is clearly shownFig. 6: Appearance of the normal N₂O/C₂H₄ flameFig. 7: Effect of the N₂ separation on the flame of Fig. 6. The pale blue outer mantle is lifted off while the interconal reducing zone is markedly lengthened

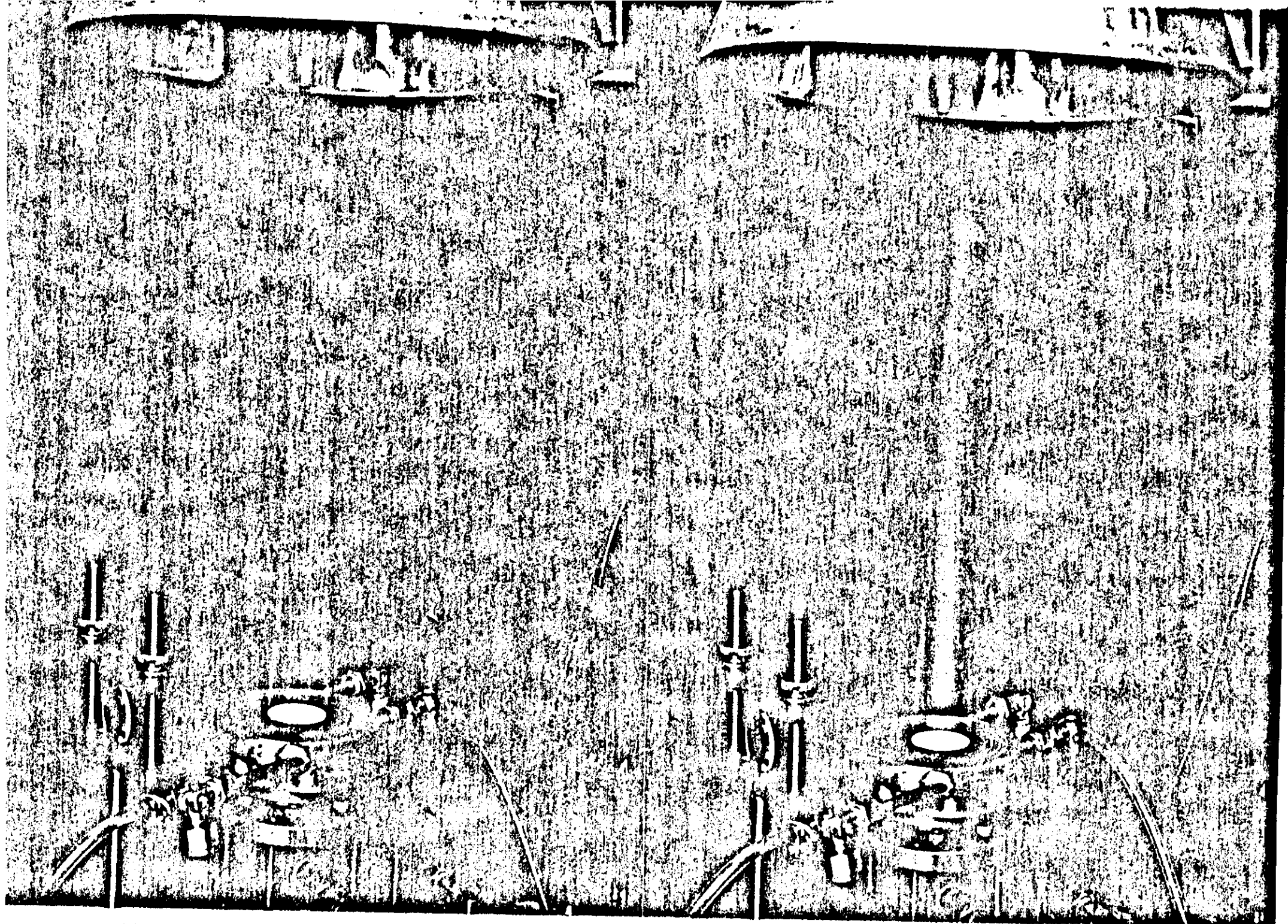


Figure 3. Complete plasma configuration

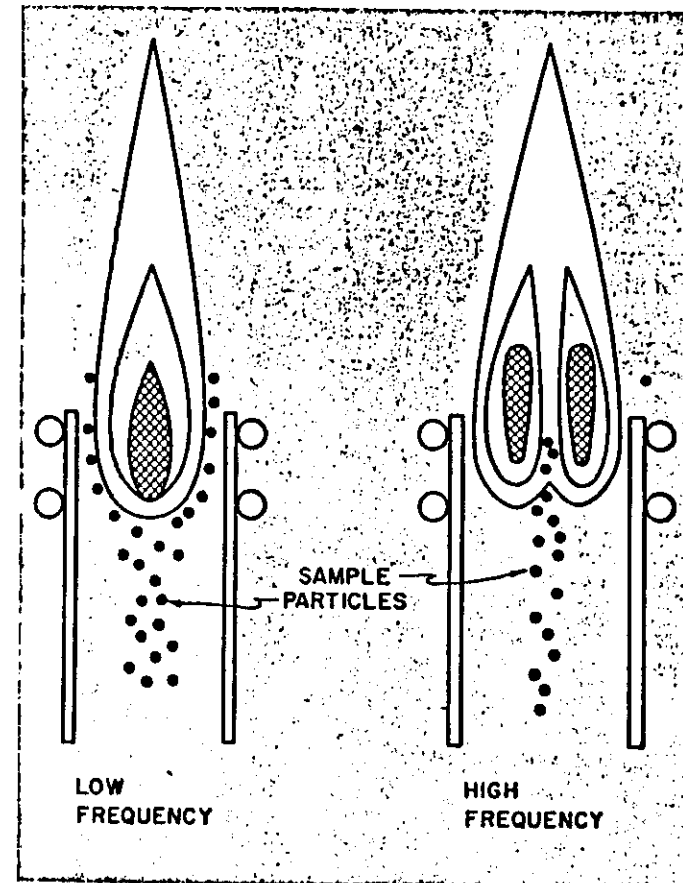
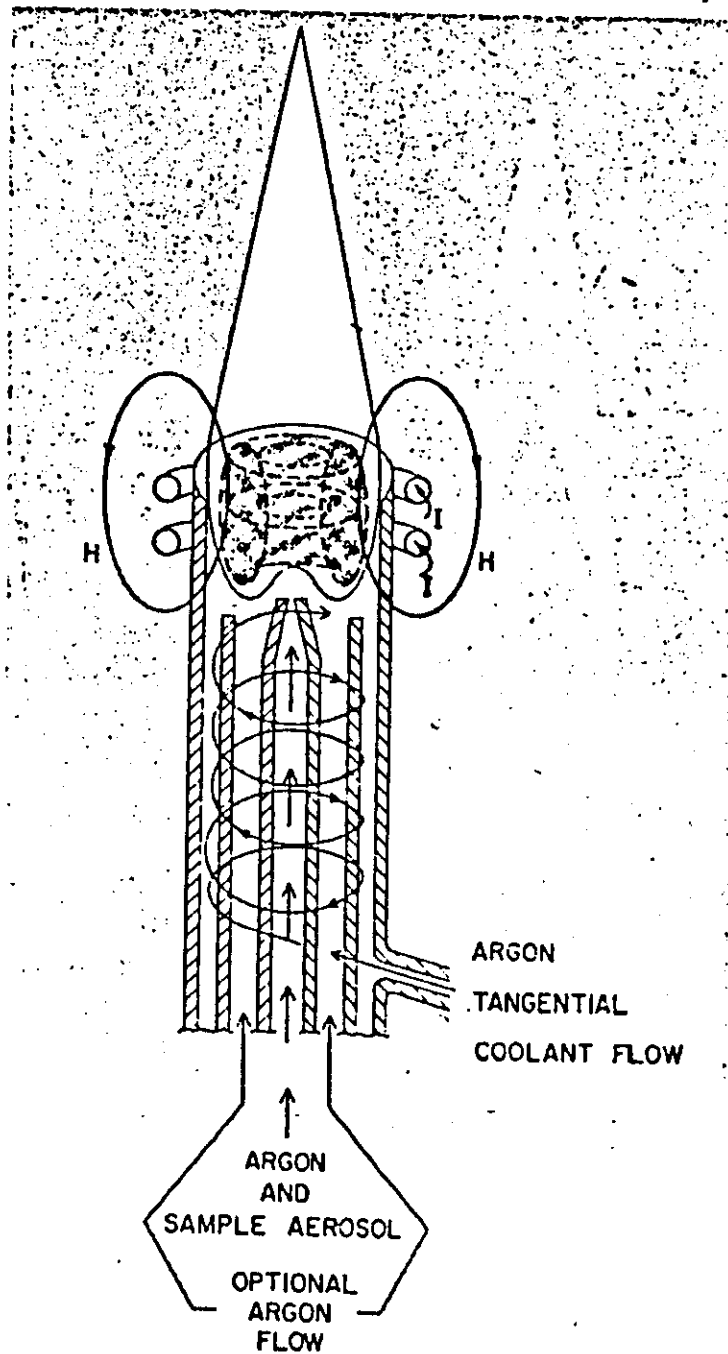
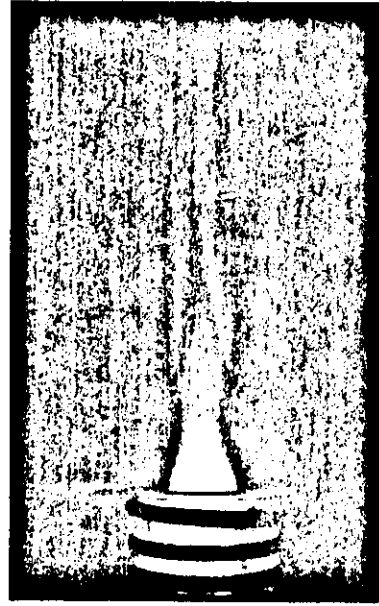
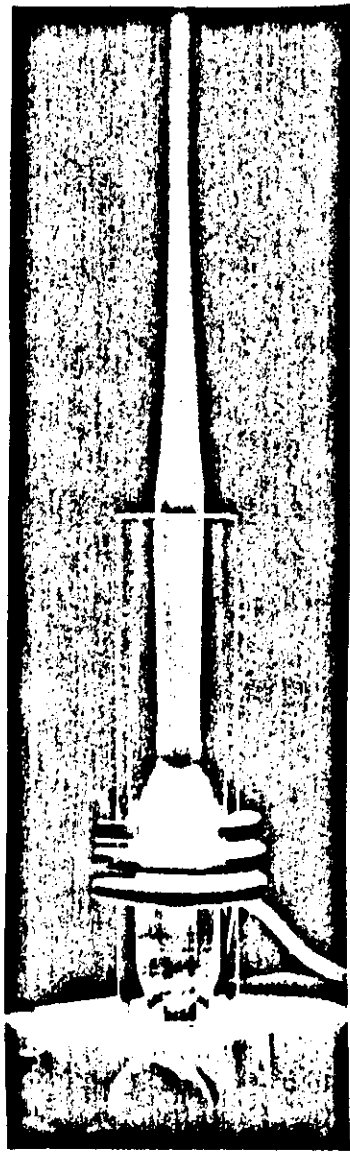


Figure 4. Sample particle paths for several plasma shapes



1.9

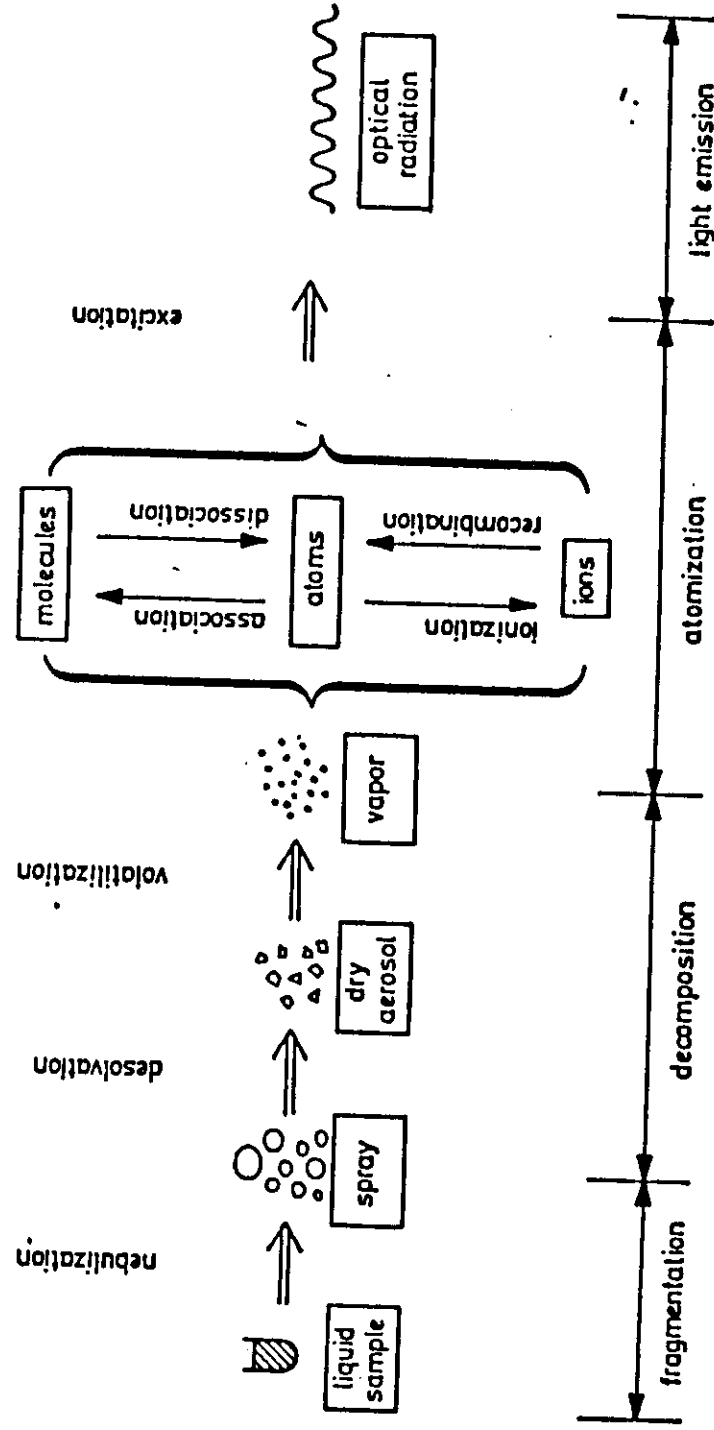


Fig. 1.2. Transformation of a liquid sample into an optically radiating vapour in emission flame photometry. The processes acting in the different stages of this transformation are indicated. The decomposition, atomization, and light-emission are discussed in the text.

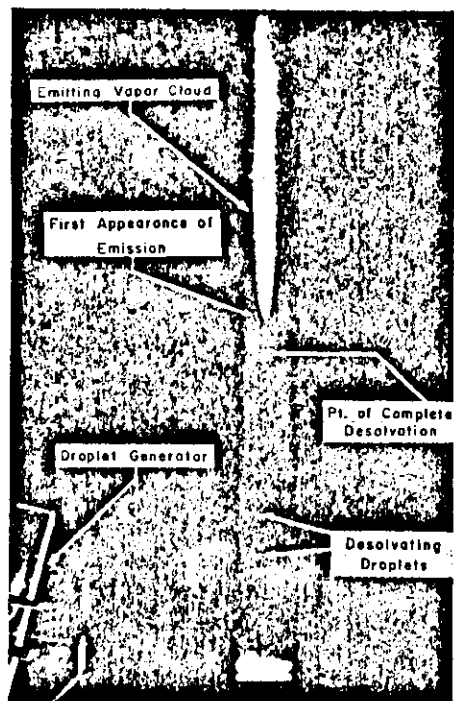


Figure 1. Photograph of isolated droplets introduced into flame
(Droplet introduction rate—1000 droplets per second)

