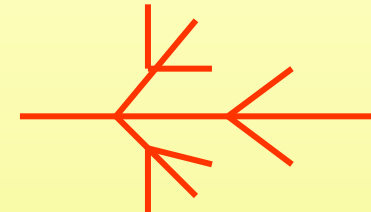
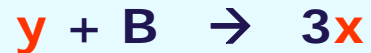




# Scientific Foundations and Efficient Methods of Controlling Combustion, Explosion and Detonation of Hydrogen and Sin Gas in Air

V.V. Azatyan

# CHAIN IGNITION

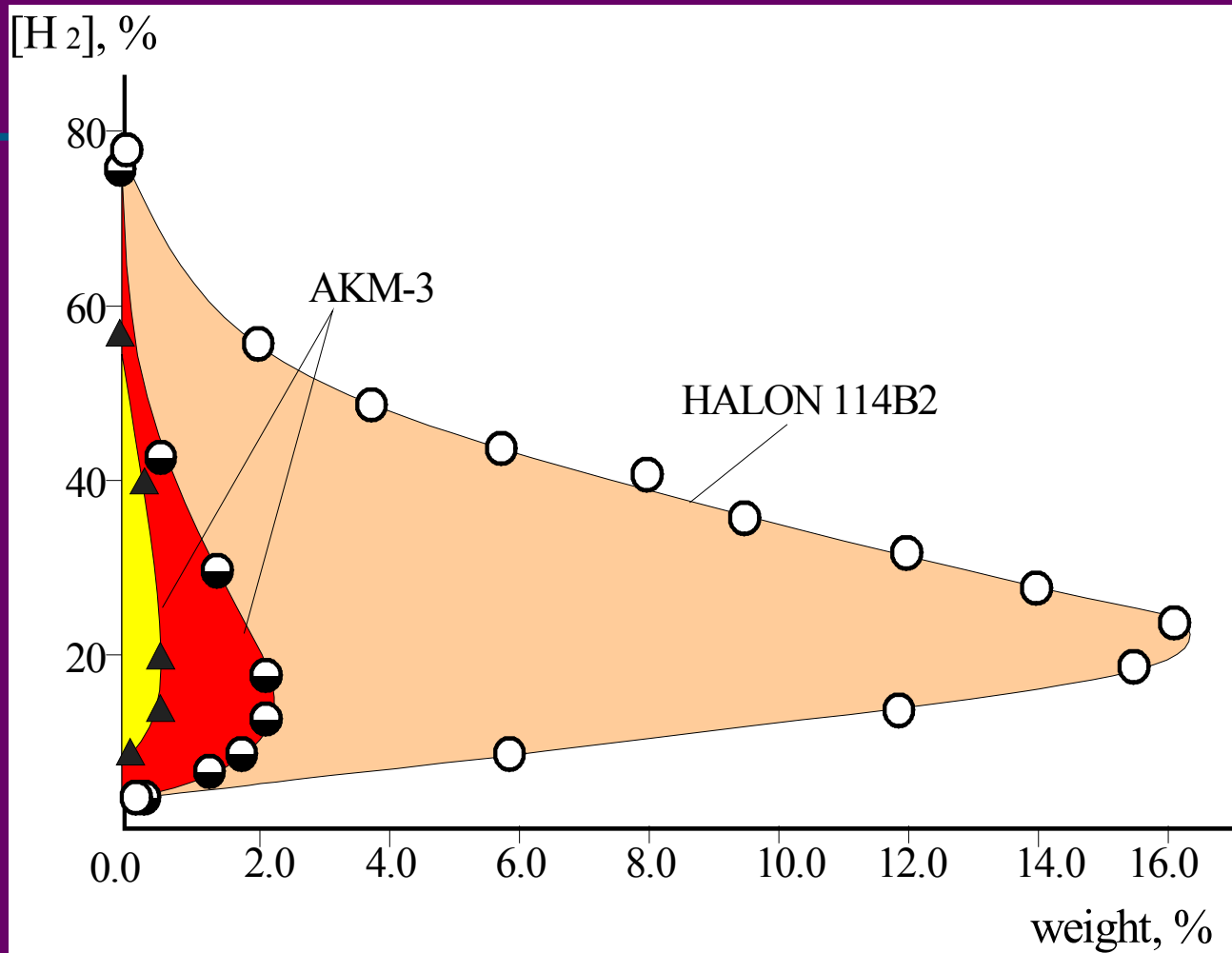


$$W = k_b[B]n$$

$$dn/dt = \omega_0 + 2k_b[B]n - gn = \omega_0 + (f - g)n$$

$$f > g, \quad d^2W/dt^2 > 0; \text{ combustion}$$

# Combustion & Explosion Areas of H<sub>2</sub> – air Mixtures



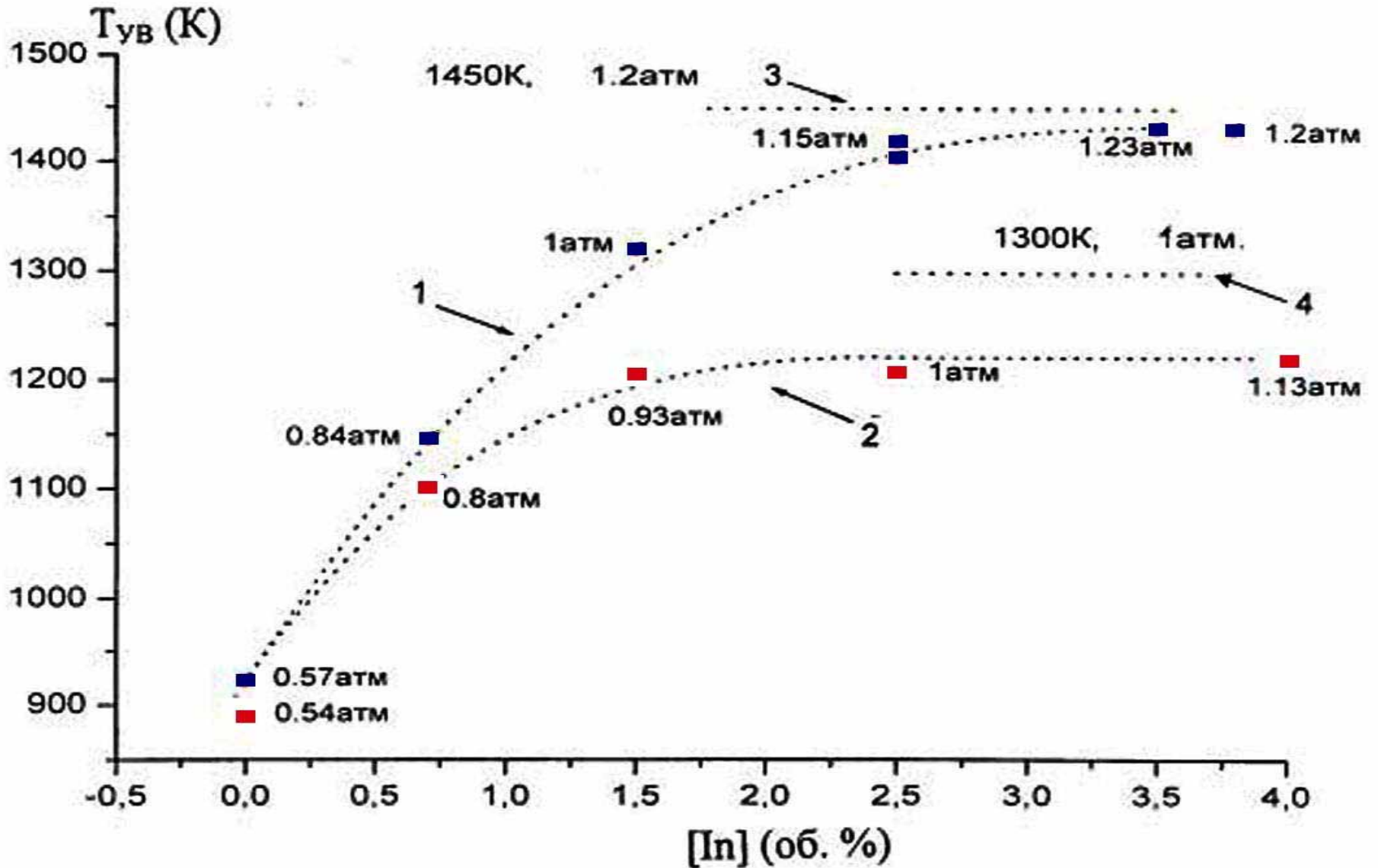
explosion



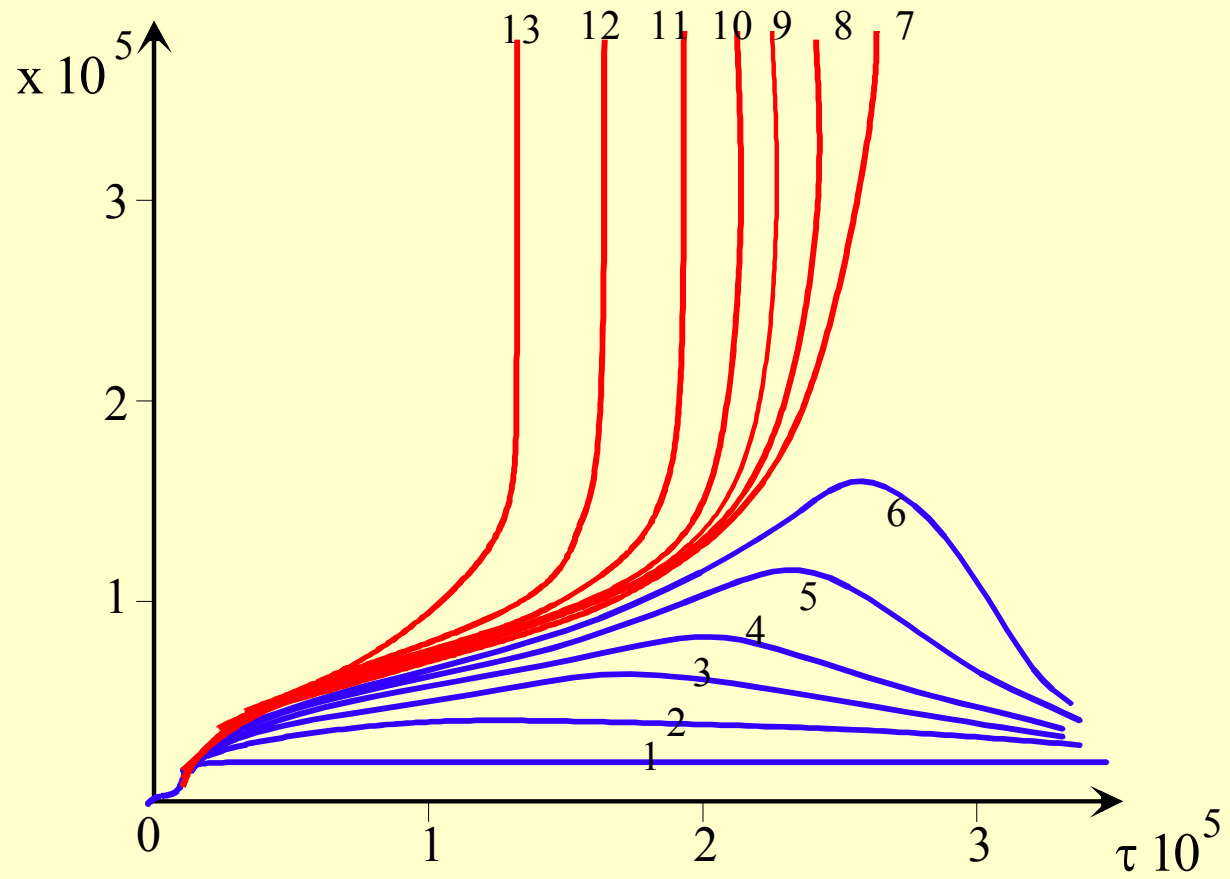
combustion



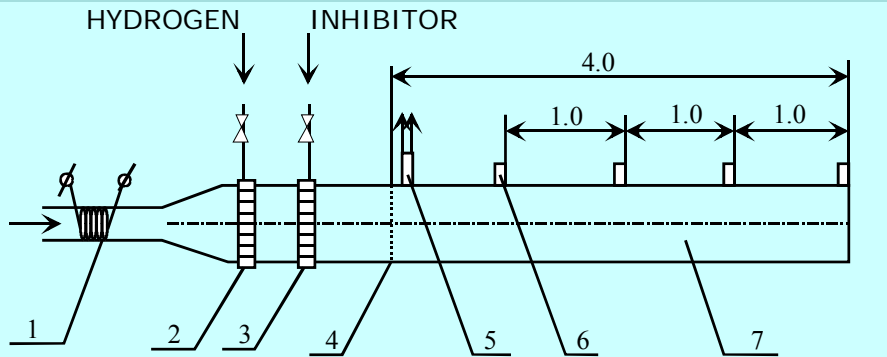
# Evidence of Combustion Chain Character



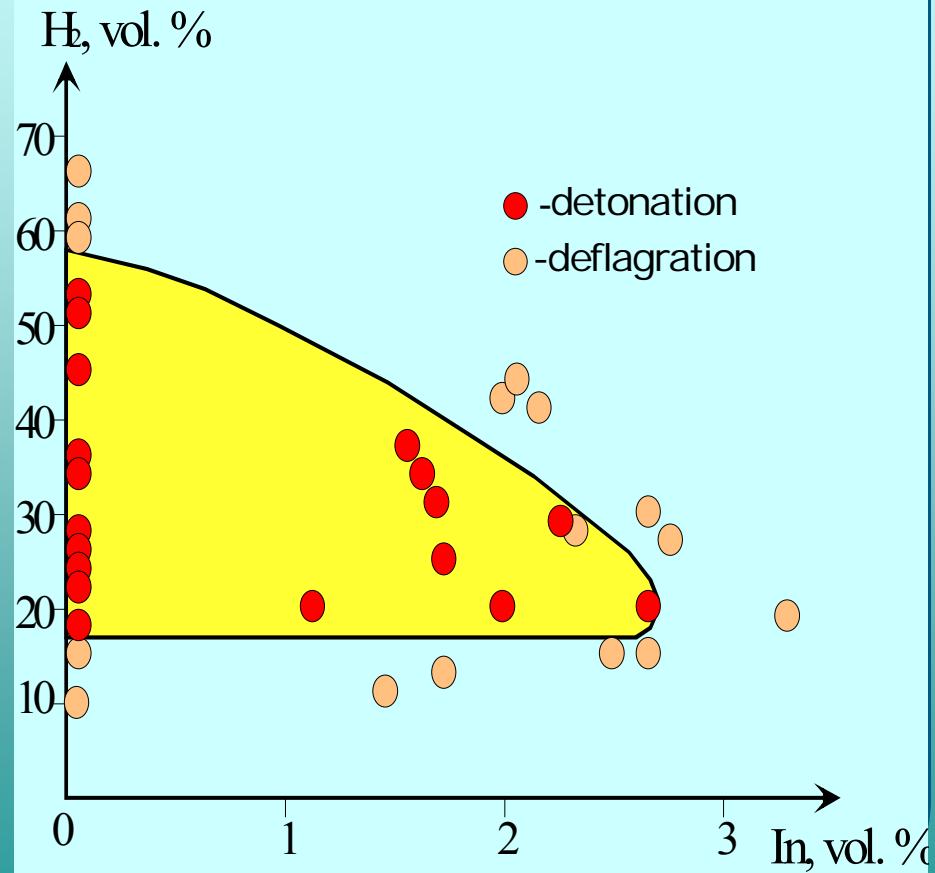
# Two Kinetics Modes of Developed Chain Combustion



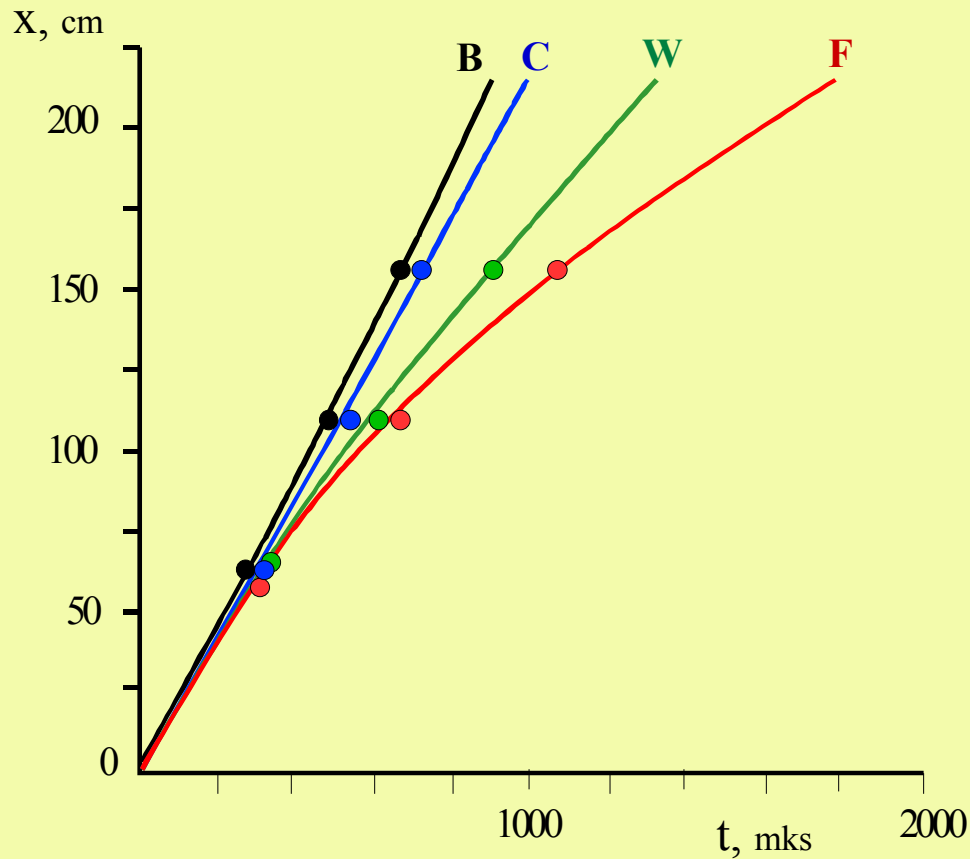
# Prevention of Transition Deflagration to Detonation



1- preheater; 2 - hydrogen mixer; 3 - inhibitor mixer; 4 - stabilizer;  
5 - igniter; 6 - pressure transducer; 7 - chamber.

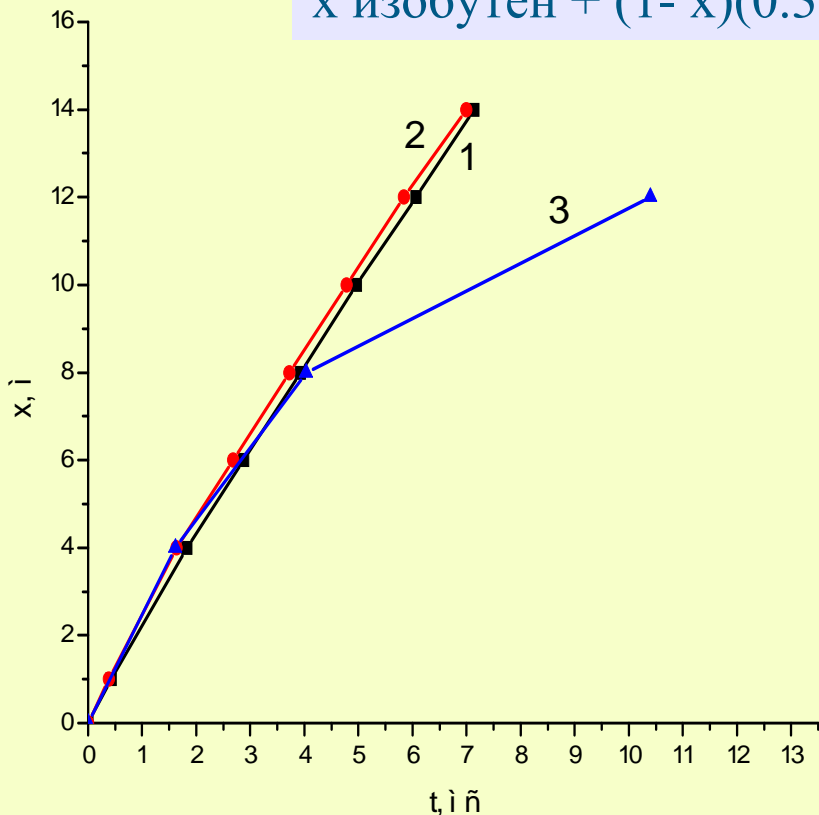


# Prevention of Detonation at Initiation by Powerful Explosion

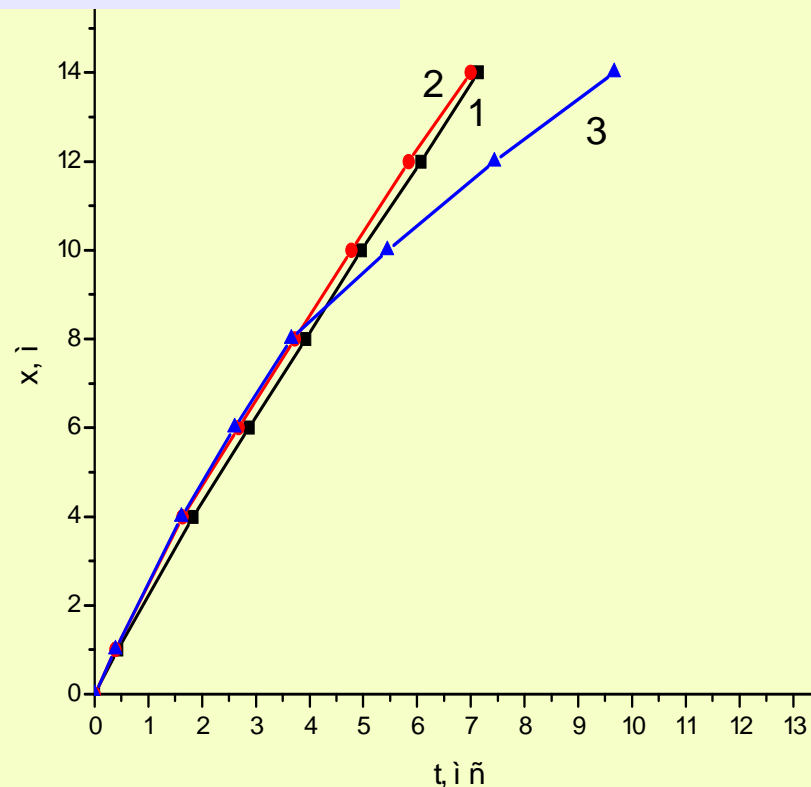


# Destroying of stationary detonation

$x$  изобутен +  $(1-x)(0.338\text{H}_2 + 0.662 \text{воздух})$

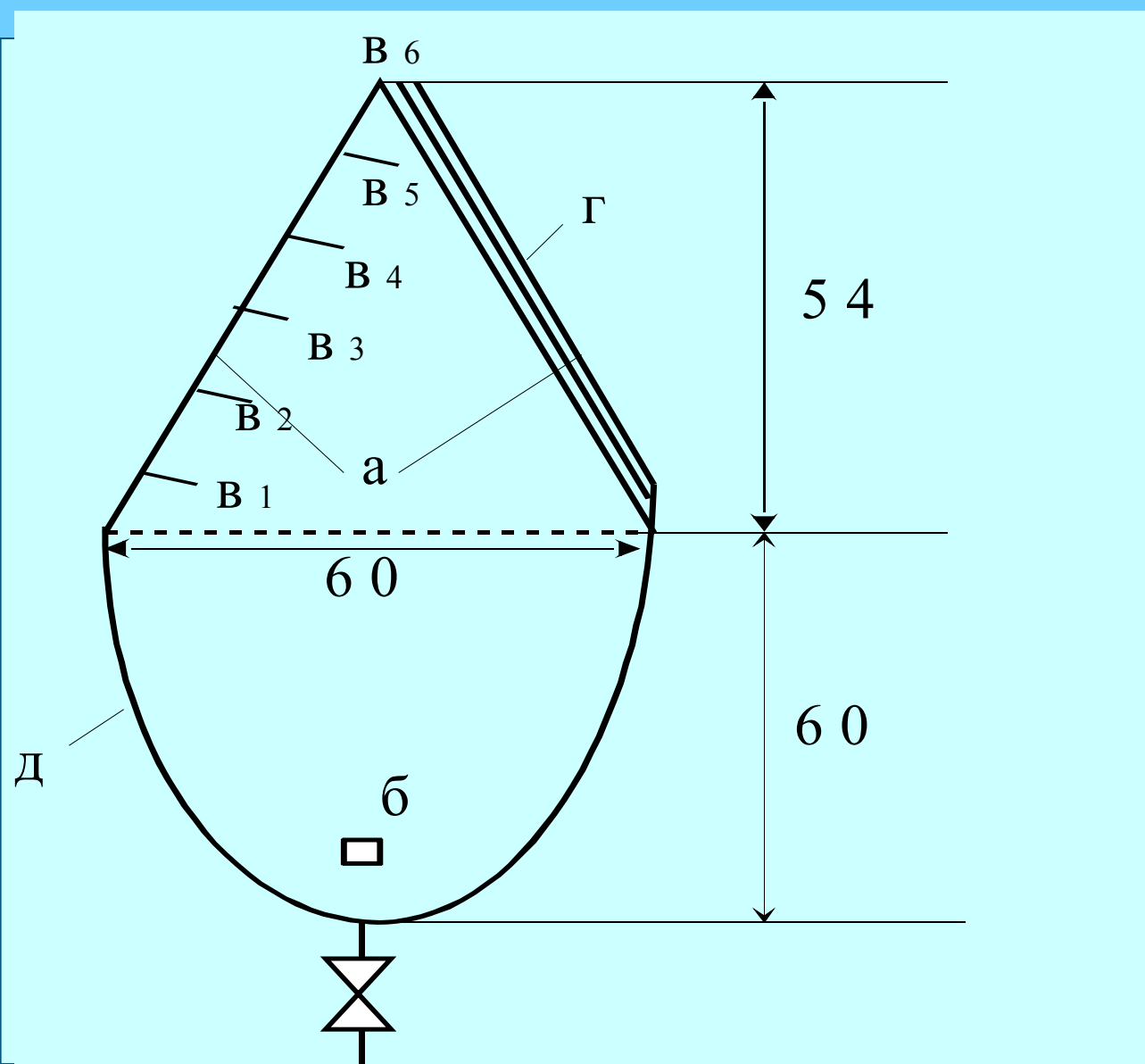


1 - 0% In – фронт пламени  
 2 - 2,0% In - фронт пламени  
 3 - 2,2% In - фронт пламени



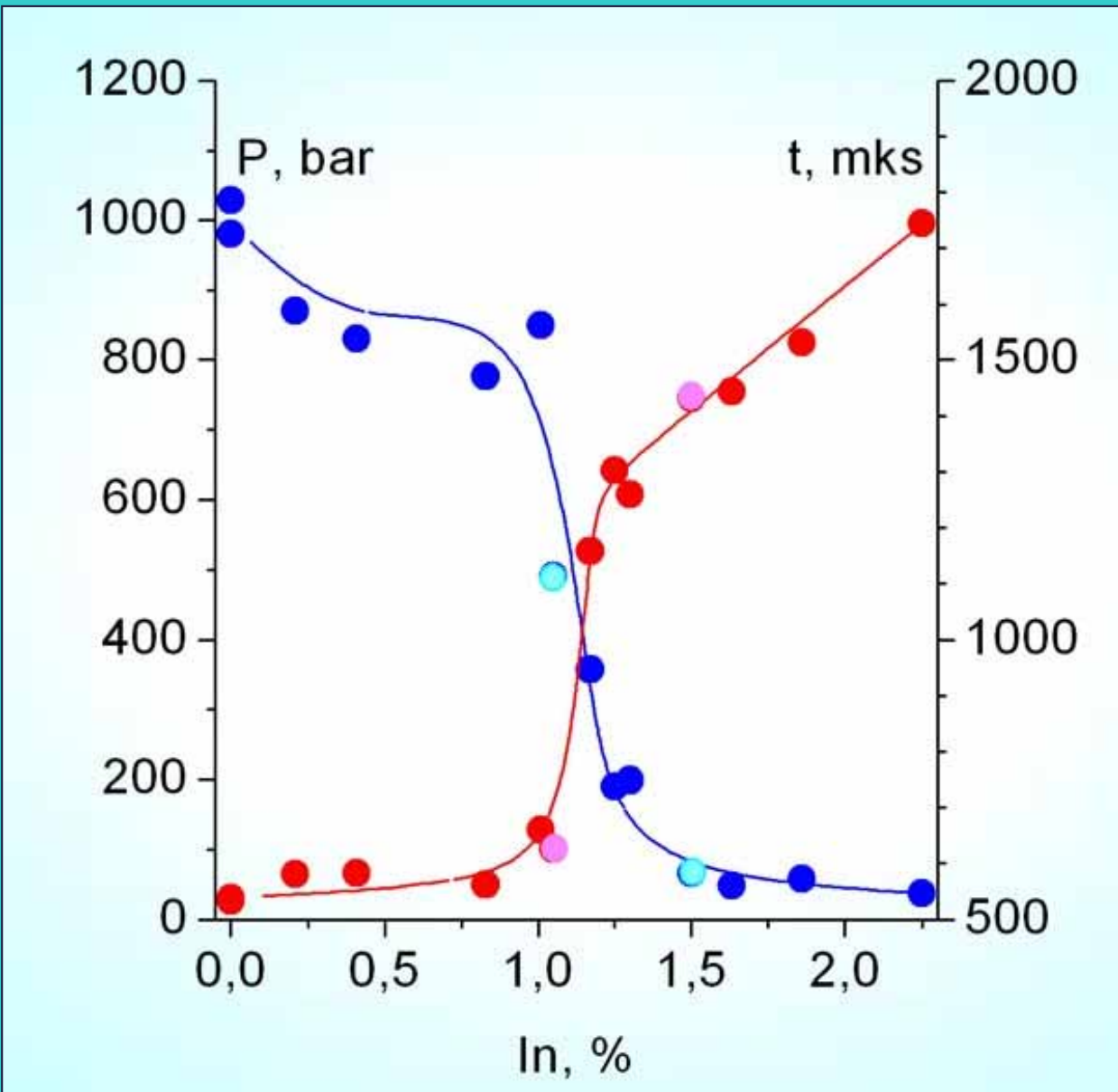
1 - 0% In – ударная волна  
 2 - 2,0% In - ударная волна  
 3 - 2,2% In - ударная волна

# Reaction Chamber for Investigation of Explosion Wave Cumulation





# Controlling Explosion in Cumulation



# To the Usage of Hydrogen, as a Fuel

