

EFFECT OF 1,1'-FERROCENEDICARBOXYLIC ACID SALTS ON THE BURNING RATE OF DOUBLE-BASE PROPELLANT

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Abstract: 1,1'-Ferrocenedicarboxylic acid (FDA) and its copper, iron, and lead salts insoluble in water were synthesized. The effect of the salts on the burning rate of double-base propellant was studied. It was shown that individually 3% of copper salt (CFDA) had the most considerable effect, it increased the burning rate by ~ 2 times in a pressure interval of 1–10 MPa. Carbon nanotubes significantly increased the efficiency of CFDA. The optimum ratio of the catalyst and nanotubes, in which the effect occurred at pressures up to 60 MPa, was found. An interesting phenomenon was observed: the iron salt affected the burning rate only at pressures up to 2 MPa, whereas at higher pressures, the effect was observed only in combination with CNT. Iron salt also reduced the efficiency of CFDA. The explanation of this fact was suggested.

Keywords: double-base propellant; combustion catalysis; burning rate modifiers; ferrocenedicarboxylic acid

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