Gaseous hydrogen addition to the basic fuel as the way for improvement of Wankel rotary engine ecological characteristics

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Wankel rotary engine
1 - inlet window;
2 - outlet window;
3 - housing;
4 - working chambers;
5 - fixed gear;
6 - rotor;
7 - gear;
8 - shaft;
9 - spark plugs

Experimental setup equipped with injectors:
1 – gasoline;
2 – hydrogen.
Influence of hydrogen mass fraction value on the toxicity of WRE exhaust gases for idle mode.

Toxic substances concentration as function of excess air ratios and various hydrogen additions.

Relationship between unburned hydrocarbons quantity and brake mean effective pressure.

Relationship between carbon monoxide fraction and brake mean effective pressure ($n=2000 \text{ min}^{-1}$).
Conclusions

Finally we can state that experiments carried out confirm the positive influence of gaseous hydrogen addition to the basic air-gasoline mixture on WRE ecological characteristics. Substantial reduction of unburned hydrocarbons and carbon monoxide concentration in exhaust gases for idling and partial loads shows that hydrogen addition contributes to increase of burning completeness in WRE. The use of hydrogen addition provides the performance stability of the engine on lean mixture on partial loads and idling mode.