ZND detonation of hydrogen and oxygen

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1 Introduction

In this report one will find a study about ZND detonation using mixture of oxygen and hydrogen. There is a connection between detonation cell size and induction time, which will be calculated in this paper. This program calculates induction time which usually is considered to equal zero.

2 Mathematical model

ZND code has been downloaded from Caltech website, it's program calculating simple detonation, has been published for the first time in 1944.
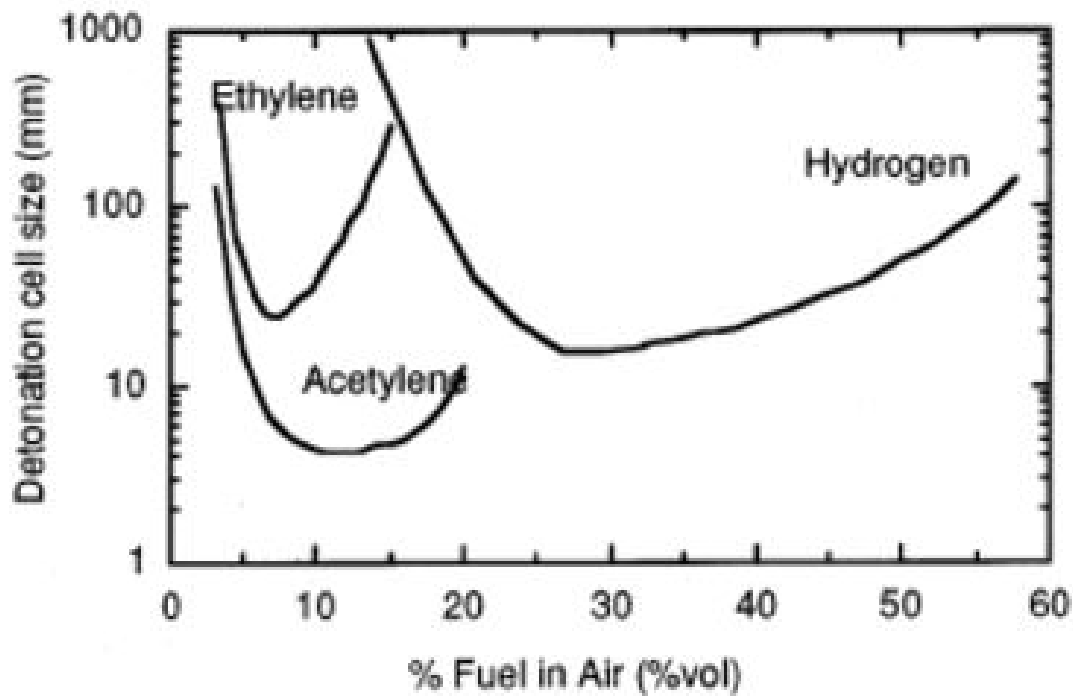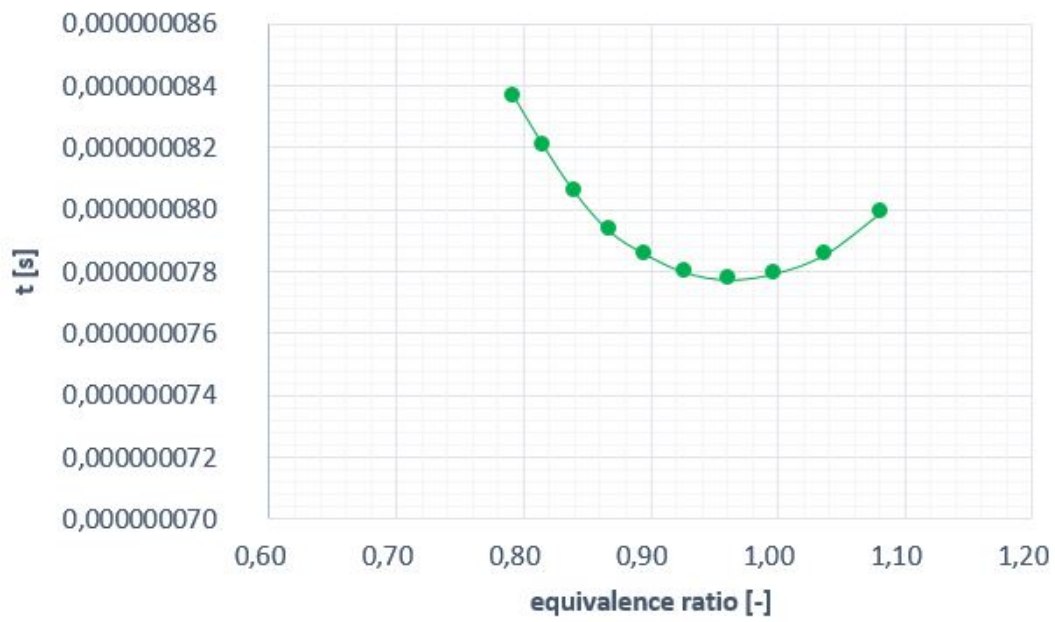
3 Results

Figure 1: Experiments data

Figure 2: Calculated ZND detonation

These two charts has similar properties, there is a relation which will be calculated below:

$$a = t_i nd/\lambda = 7,77E - 08/0,0121 = 6,65E - 06 \tag{1}$$

4 Summary

Program for calculating ZND detonation produced related to experiments results. Induction time happened to be measured in $seconds^-8$. Detonation of hydrogen with oxygen is extremely fast, this is why this mixture is called Knallgas (Scandinavian and German Knallgas: "bang-gas").

5 References

[1] ZND program
$http://shepherd.caltech.edu/EDL/public/cantera/html/SD_Toolbox/ZND$
　　[2] Properties of Hydrogen
http://www.cnbyxf.com/Doc/data.WebNoteBooks2010/07/20100728122525