

Online Database for hydrogen flame data

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Literature surveys of combustion characteristics of different fuels, such as flame speeds, ignition limits, detonation limits, etc...are often lengthy and cumbersome. Inspired by the Detonation Database created by J. Shepherd at Caltech, we propose a similar research tool for storing and searching such data. The criteria for construction of such a database is that it can be easily searchable and could be easily updated by a third party without requiring any further programming or knowledge of the structure of database.

The present work thus reports the construction of such an online database. We first report a flame speed compilation for laminar burning velocity data of hydrogen/diluents fuel mixtures at various mixture compositions and initial conditions.

The dynamic database has been established using the web development framework Django which is written in Python. The database consists of different folders. Each folder represents one research paper as a reference and contains different files. One file represents a specific data of a particular mixture at specific conditions. The mixture is identified by its compositions. The temperature, the pressure and other details are indicated in order to distinguish the data.

After the database is created, a data management system provides an interface between the user and the database. The interface designed as a website format is a templating engine for rendering the data in a dynamic graph or tables. The user chooses the mixture and select from a list the characteristic which correspond to the abscises in the flame speed graph. Then, he specifies the oxidant and the range of temperature and pressure. The input conditions selected, a graph or a table of the flame speed will appear with all the data matching present in the database. Certainly, the data is drawn in different colors depending on the reference and the conditions. Furthermore, all the references are available to be downloaded from the same interface.

The database can be constantly updated. In order to add more data, one only needs to add the file containing the new data and specify the composition of the reactive mixture and the initial conditions. This database as a management tool will serve to find and to compare any flame speed measurements present via a dynamic graph. It is worth noting that this work can be extended to any other data other than the flame speed with adapting only few modifications.

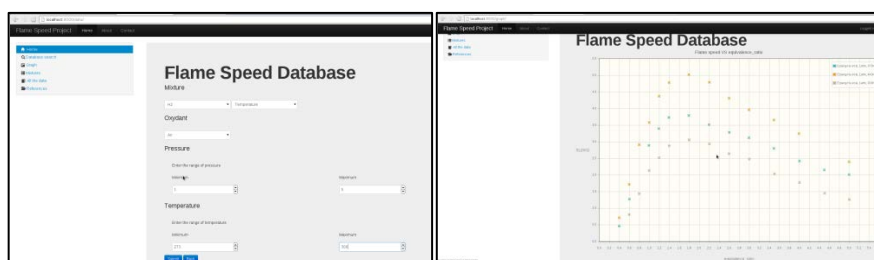


Figure. Screenshots of the flame speed database.