

LAMINAR BURNING VELOCITIES OF GAS
MIXTURES

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Dedication

This thesis is dedicated to my family, my Mother and Father and my Brother

PREVIEW

LAMINAR BURNING VELOCITIES OF GAS
MIXTURES

by

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THESIS

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Abstract

In this study, burning velocities of hydrogen-carbon monoxide ($\text{H}_2\text{-CO}$) mixtures, which are primary constituents of syngas fuels, are measured. The effect of different burner systems, H_2 concentration, and different measurement techniques on the burning velocities of $\text{H}_2\text{-CO}$ mixtures is also discussed. The burning velocities of $\text{H}_2\text{-CO}$ mixtures increase with the increase in H_2 content in the mixture. When compared with different burner systems using different methods, the burning velocity data almost coincide in the lean condition, but at rich condition the data stray away from each other. The burning velocities of actual syngas compositions (based on different sources of coal) are then measured and analyzed to determine the effects of diluents on the burning velocities of syngas mixtures. As diluents, carbon dioxide (CO_2) plays a dominating role on the burning velocity when compared to nitrogen (N_2). Finally, the burning velocities of H_2 -methane (CH_4) mixtures are measured to determine the effect H_2 on the burning velocities of $\text{H}_2\text{-CH}_4$ mixtures.

Table of Contents

Abstract	v
1.0 Introduction.....	1
1.1 Research Objectives	2
1.2 Thesis Organization.....	2
1.3 Practical Relevance	3
1.4 Combustion and Propulsion Research Laboratory	3
2.0 Literature Review.....	4
2.1 Syngas	4
2.2 Laminar Burning Velocities of Mixtures	4
2.3 Laminar Burning Velocities of H ₂ -CO Mixtures	6
2.4 Methods to Determine the Laminar Burning Velocity.....	7
2.4.1 Burner Method	7
2.4.2 Flat Flame Burner Method	7
2.4.3 Soap Bubble Method	8
2.4.4 Closed Spherical Bomb Method.....	8
2.4.5 Cylindrical Tube Method	9
3.0 Experimental Facilities	9
3.1 Burner System	10
3.1.1 Reduced Burner	10
3.1.2 Flat Flame Burner.....	11
3.1.3 Nozzle Burner.....	12
3.2 Measurement Techniques.....	14
3.2.1 Schlieren Method	14

3.2.2	Intensifier Method	16
3.2.3	Direct Imaging Method	17
3.3	Flow Measurement Devices and Data Acquisition	18
3.3.1	Flow Meter	18
3.3.2	Metering and Shutoff Valves	20
3.3.3	Data Acquisition	20
4.0	Results and Discussion	23
4.1	H ₂ -CO Mixtures	23
4.1.1	Burner Effect on Laminar Burning Velocity of H ₂ /CO/Air	27
4.1.2	Comparisons between Different Measurement Techniques (30% H ₂)	28
4.2	Effects of Diluents on Burning Velocity of Syngas	29
4.3	Compositions of Syngas Fuels	30
4.4	CH ₄ -H ₂ Mixtures	34
4.5	Quantification	37
5.0	Conclusions	39
	References	40
	Curriculum Vita	42

List of Figures

Figure 3.2 Experimental Setup: Reduced Burner	11
Figure 3.3 Flat Flame Burner.....	12
Figure 3.4 Cross Sectional View of Flat Flame Burner.....	12
Figure 3.5 Nozzle Burner.....	13
Figure 3.6 Cross Sectional View of the Burner	14
Figure 3.7 Dolan-Jenner 900 W Light Source	15
Figure 3.8: The Conceptual Schlieren System.....	15
Figure 3.9 Experimental Setup for Schlieren Imaging System.....	16
Figure 3.10 Flames using Schlieren Technique.....	16
Figure 3.11 Flames using Intensifier Camera	17
Figure 3.12 Schematic Representation of Intensifier Method	17
Figure 3.13 Flames using Direct Imaging Technique.....	18
Figure 3.14 Digital Mass Flow Meter.....	19
Figure 3.15 Dry Cal Calibrator	19
Figure 3.16 Swagelok SS-SS4VH Metering Value 1	20
Figure 3.17 Swagelok SS-4P4T4 Shutoff Value 1	20
Figure 3.18 NI USB 9263	21
Figure 3.19 S-type Thermocouple	21
Figure 3.20 Front Panel for Data Acquisition.....	22
Figure 4.1 Laminar Burning Velocities 10% H ₂ - 90% CO	23
Figure 4.2 Laminar Burning Velocities for 15% H ₂ - 85% CO	24
Figure 4.3 Laminar Burning Velocities for 20% H ₂ - 80% CO	24

Figure 4.4 Laminar Burning Velocities for 25% H ₂ - 75% CO	25
Figure 4.5 Laminar Burning Velocities for 30% H ₂ - 70% CO	25
Figure 4.6 Comparison of Burning velocities of syngas at Different Mixture Compositions.....	26
Figure 4.7 Laminar Burning Velocity Comparison between Different Burner Systems (30% H ₂)	28
Figure 4.8 Comparisons between Different Measurement Techniques (30% H ₂).....	28
Figure 4.8 Effect of Diluents on Burning Velocity.....	29
Figure 4.9 Laminar Burning Velocities of Brown Coal	30
Figure 4.10 Laminar Burning Velocities of Bituminous Coal.....	31
Figure 4.11 Laminar Burning Velocities of Lignite	31
Figure 4.12 Laminar Burning Velocities of Coke	32
Figure 4.13 Burning Velocity of Actual Syngas Compositions	33
Figure 4.14 Laminar Burning Velocities for 10% H ₂ - 90% CH ₄	34
Figure 4.15 Laminar Burning Velocities for 15% H ₂ - 85% CH ₄	35
Figure 4.16 Laminar Burning Velocities for 20% H ₂ - 80% CH ₄	35
Figure 4.17 Laminar Burning Velocities for 25% H ₂ - 75% CH ₄	36
Figure 4.18 Laminar Burning Velocities for 30% H ₂ - 70% CH ₄	36
Figure 4.19 Laminar Burning Velocity of H ₂ -CH ₄ Mixtures	37
Figure 4.16 Comparison with Other Measurements (30% H ₂ +70% CO).....	38