

# Data analysis report

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March 28, 2022

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# 1 Gaussian Mixture modelling:GMM

## 1.1 No. of Cluster: 3

### 1.1.1 Fuels in each cluster

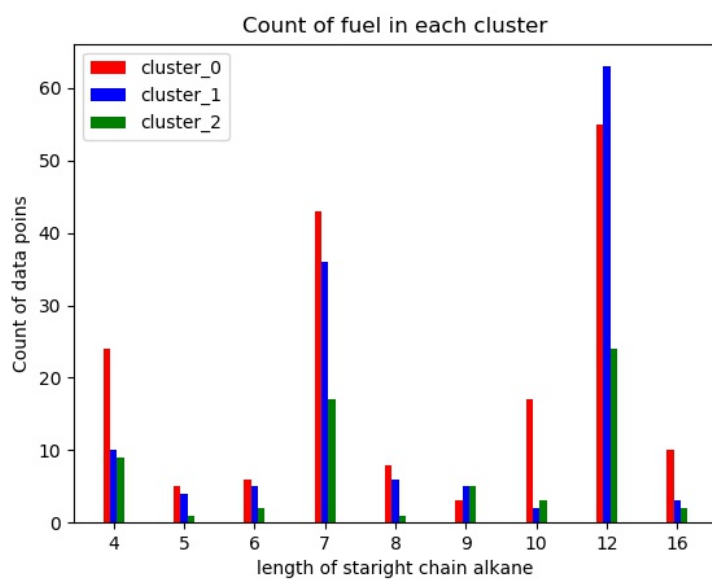


Figure 1: Histogram of fuel for each cluster

### 1.1.2 Fraction of fuels in each cluster

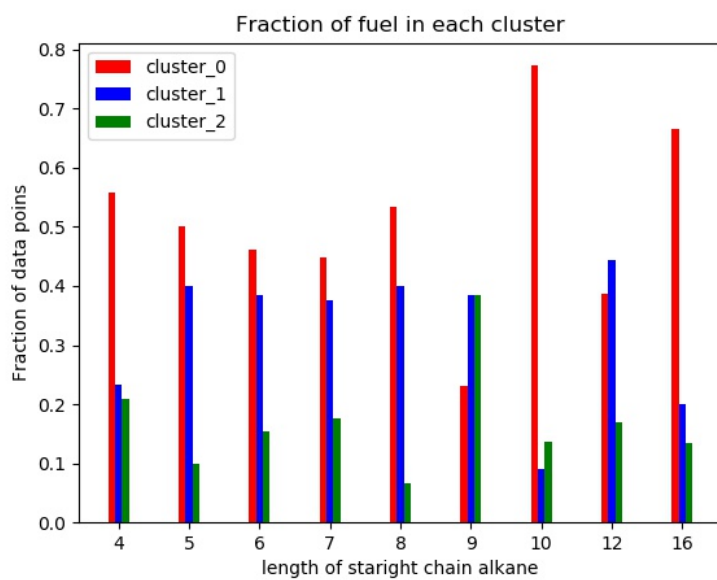


Figure 2: Histogram of fuel fraction for each cluster

### 1.1.3 Parameters cluster-wise

- cluster-1

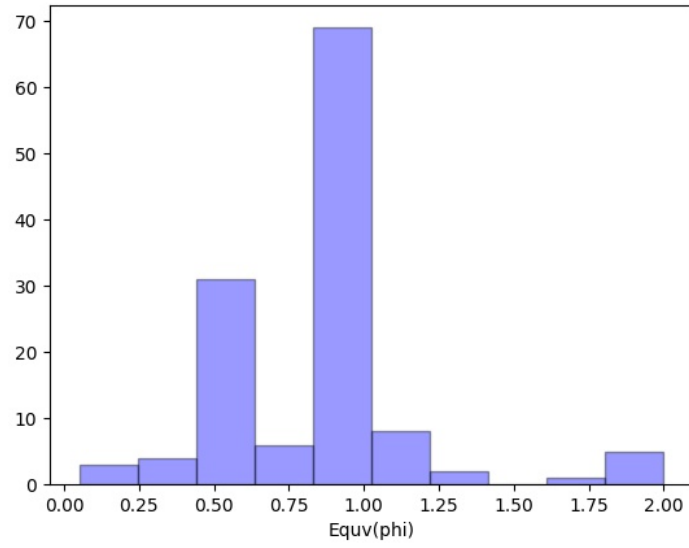


Figure 3: Histogram of Equv(phi)

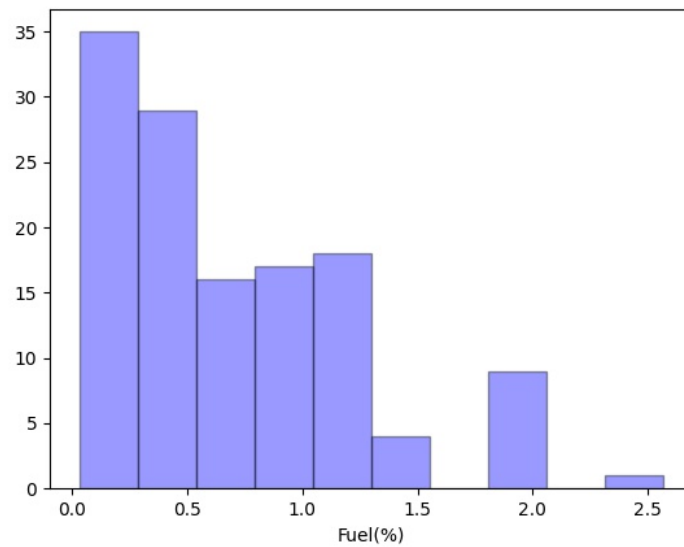


Figure 4: Histogram of Fuel(%)

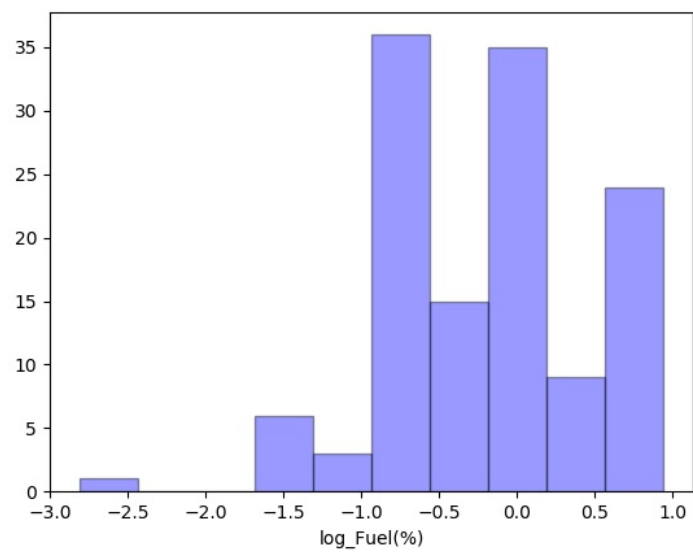


Figure 5: Histogram of log Fuel



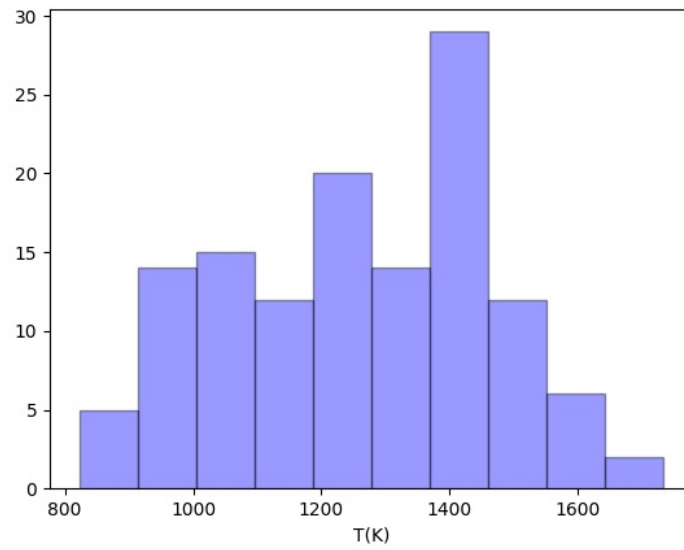


Figure 6: Histogram of Temperature

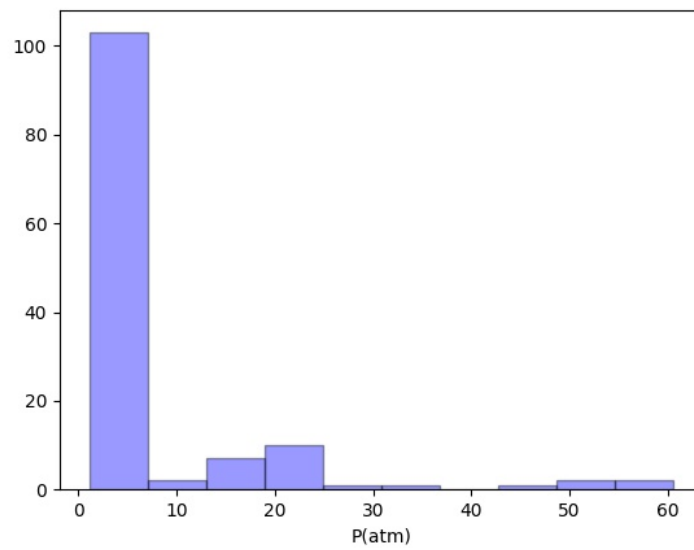


Figure 7: Histogram of Pressure

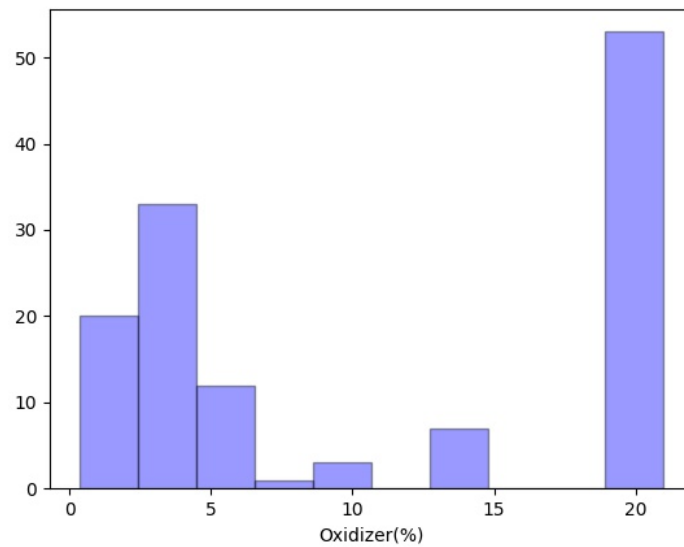


Figure 8: Histogram of Oxidizer

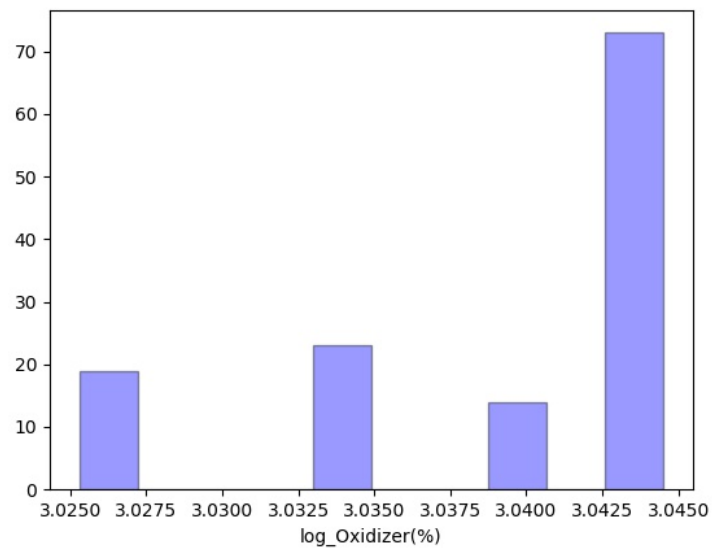


Figure 9: Histogram of log Oxidizer

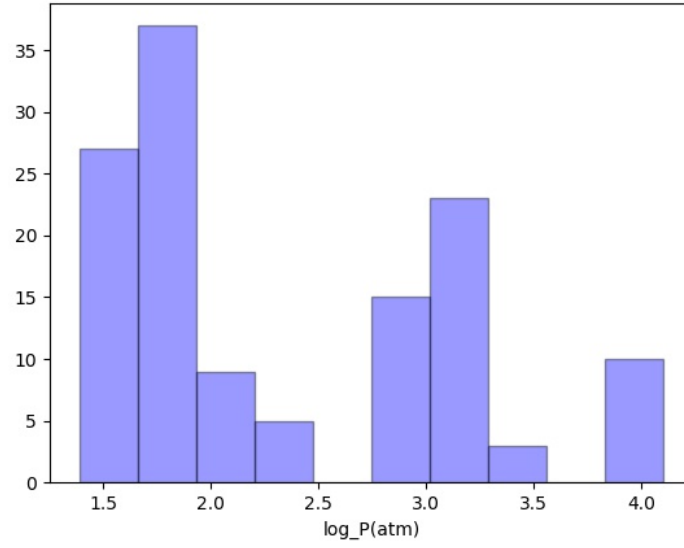


Figure 10: Histogram of log Pressure

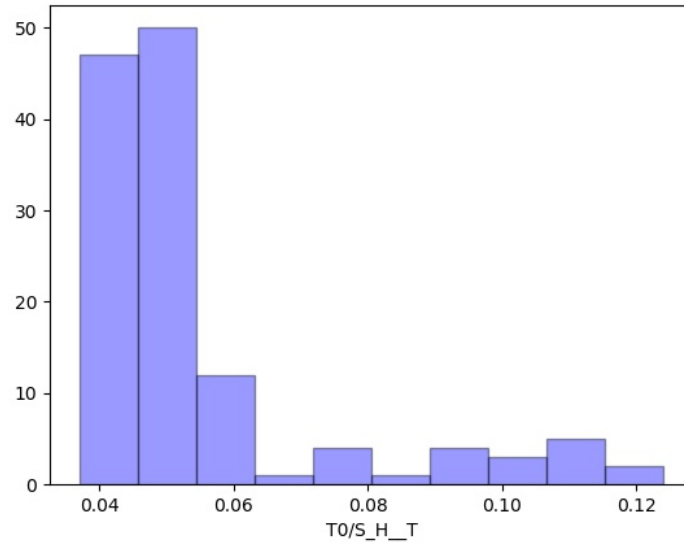


Figure 11: Histogram of T0 by CSH T

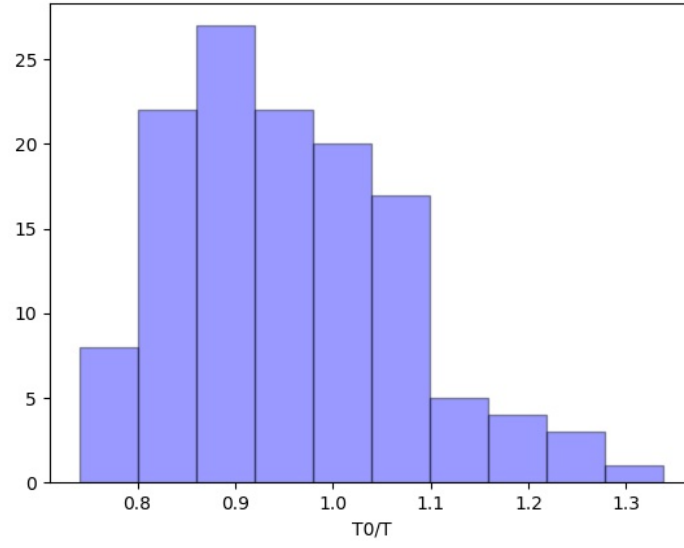


Figure 12: Histogram of  $T_0$  by  $T$

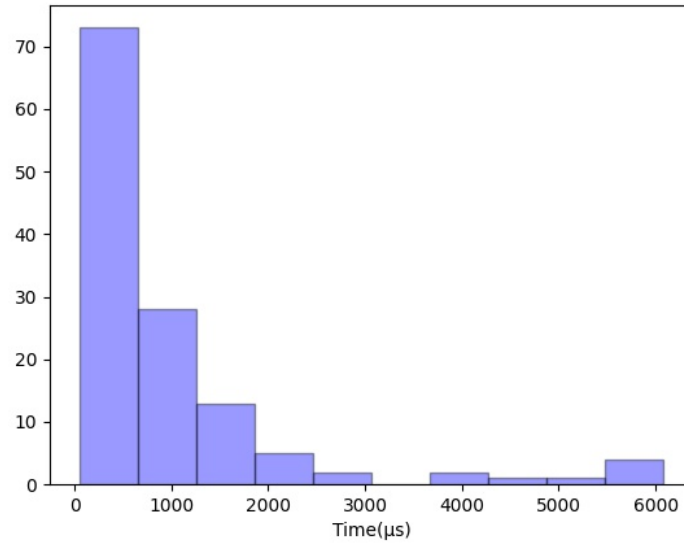


Figure 13: Histogram of time

- cluster-1

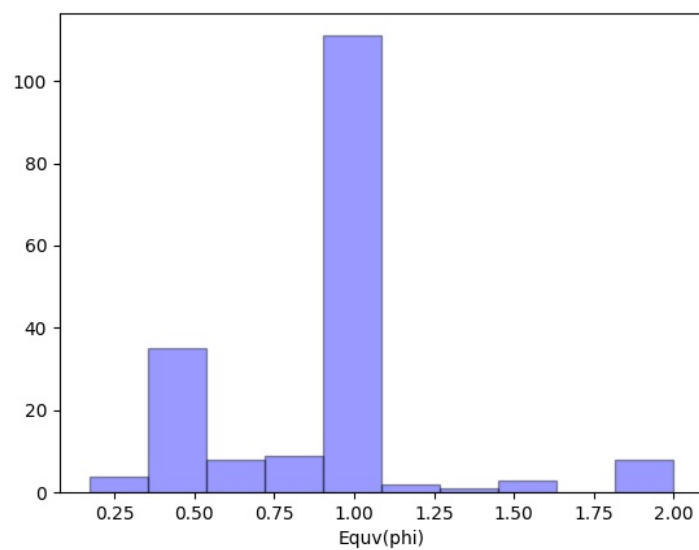


Figure 14: Histogram of Equv(phi)

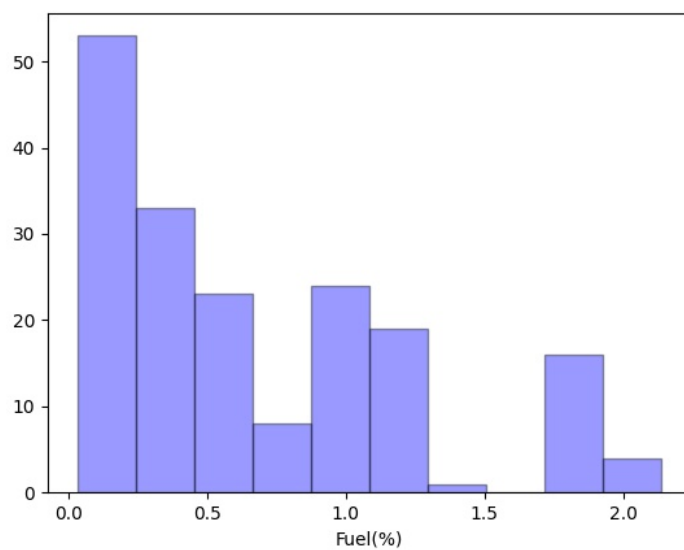


Figure 15: Histogram of Fuel(%)

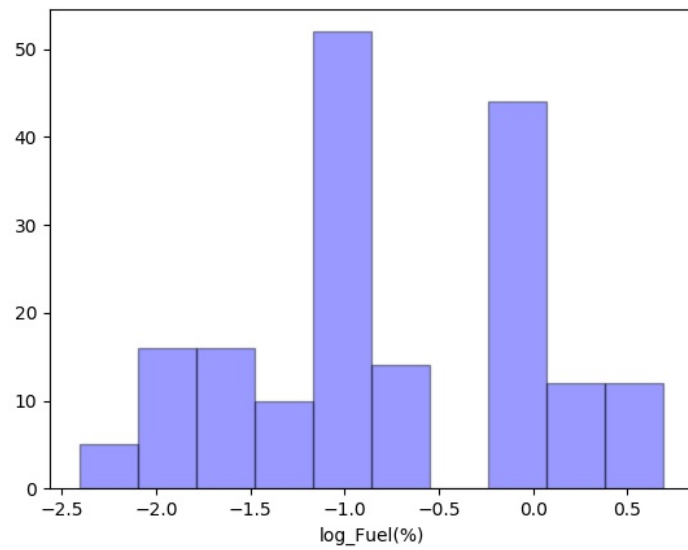


Figure 16: Histogram of log Fuel

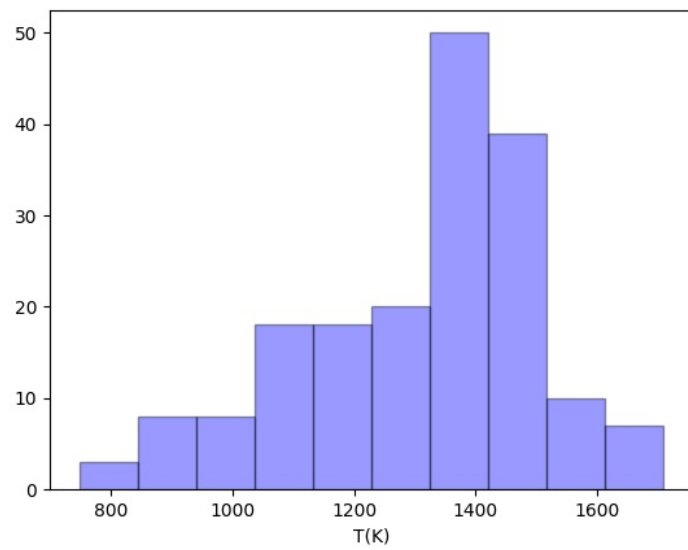


Figure 17: Histogram of Temperature

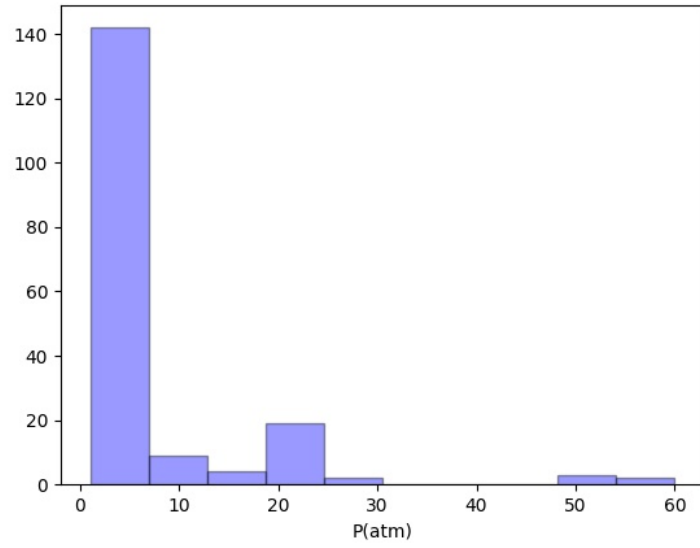


Figure 18: Histogram of Pressure

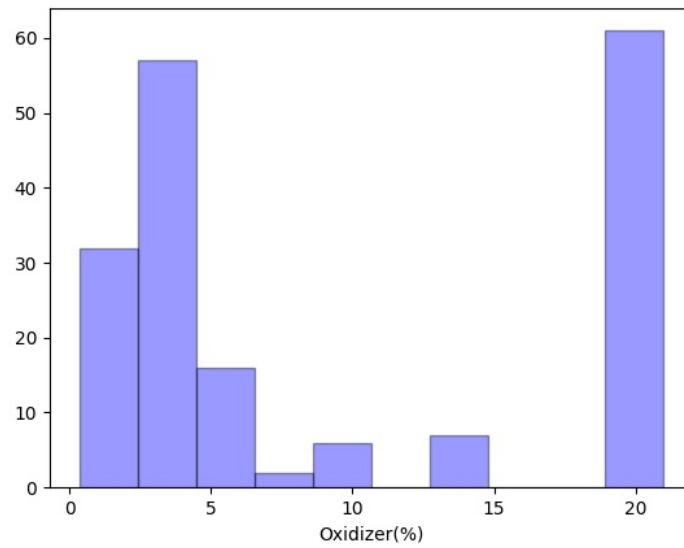


Figure 19: Histogram of Oxidizer

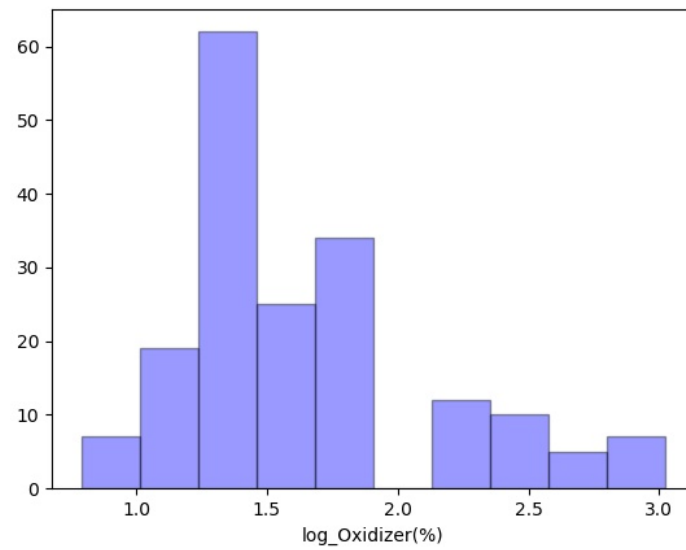


Figure 20: Histogram of log Oxidizer

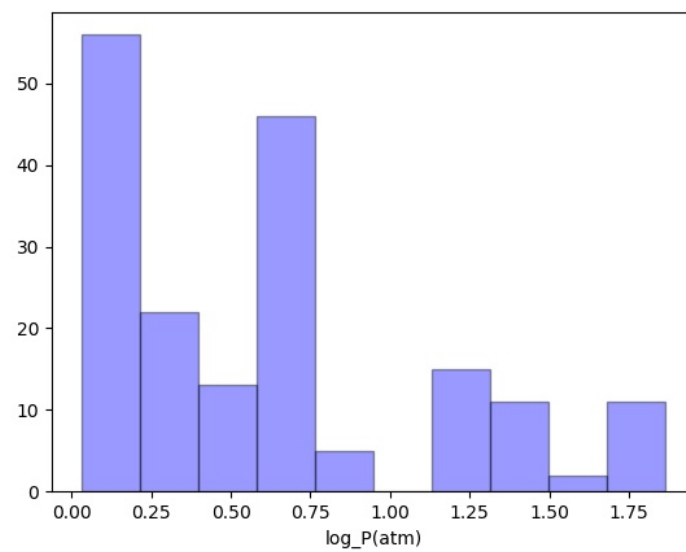


Figure 21: Histogram of log Pressure



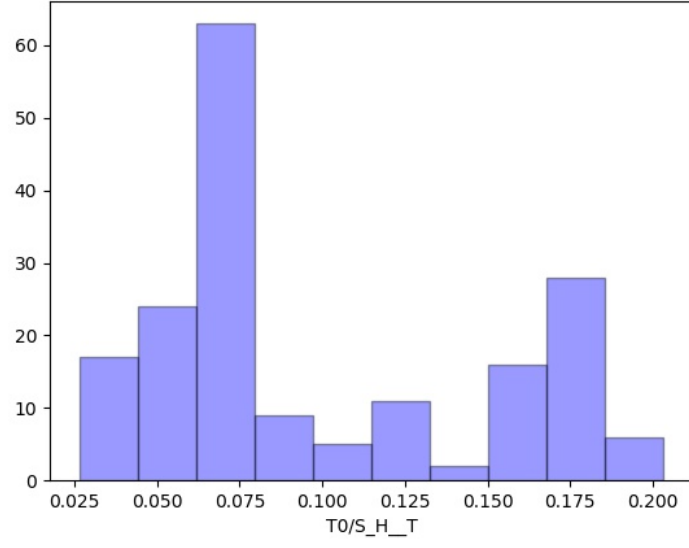


Figure 22: Histogram of  $T_0$  by CSH  $T$

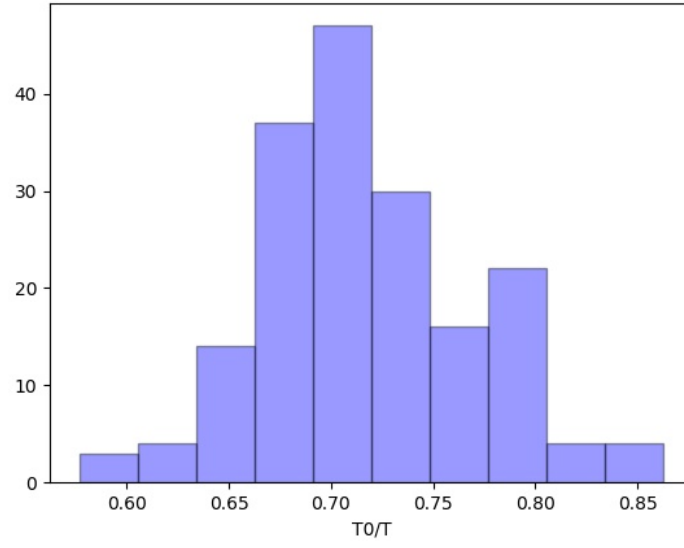


Figure 23: Histogram of  $T_0$  by  $T$

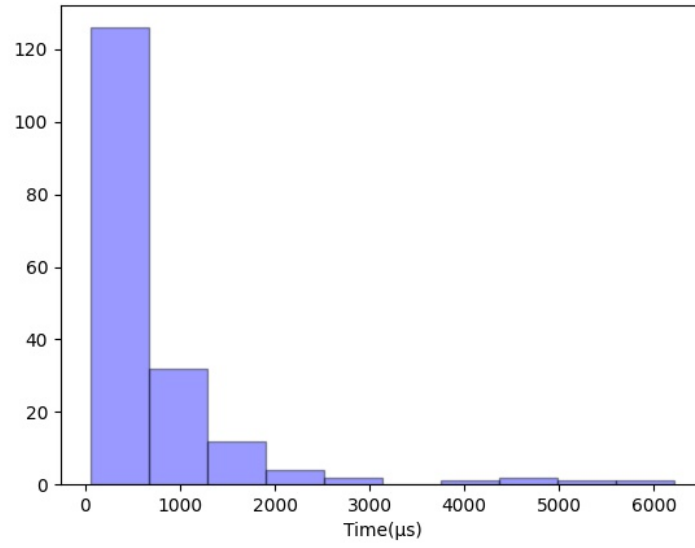


Figure 24: Histogram of time

- cluster-2

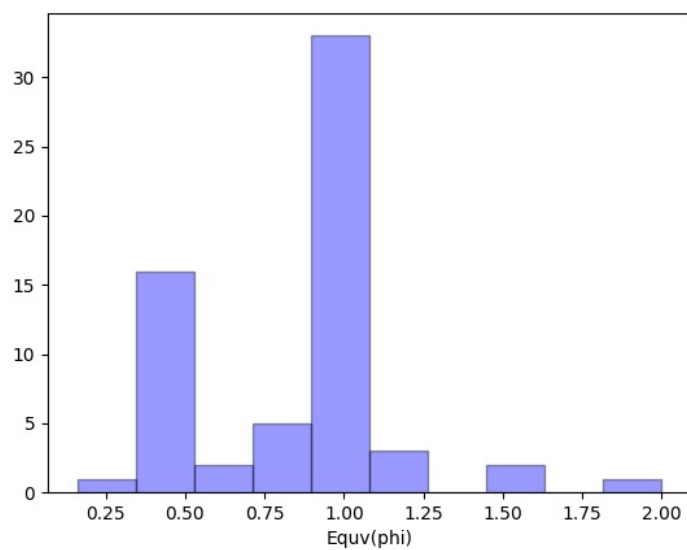


Figure 25: Histogram of Equv(phi)

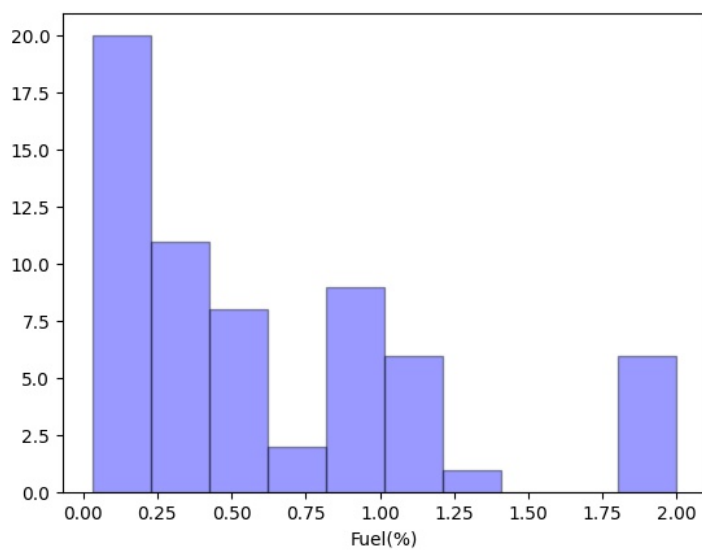


Figure 26: Histogram of Fuel(%)

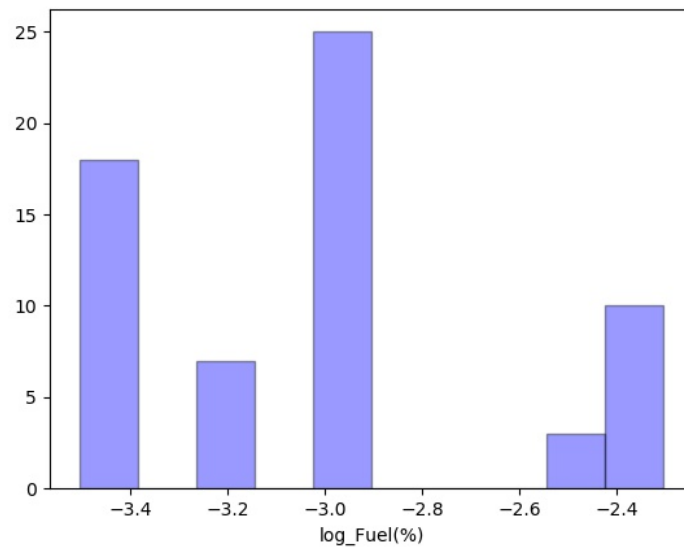


Figure 27: Histogram of log Fuel

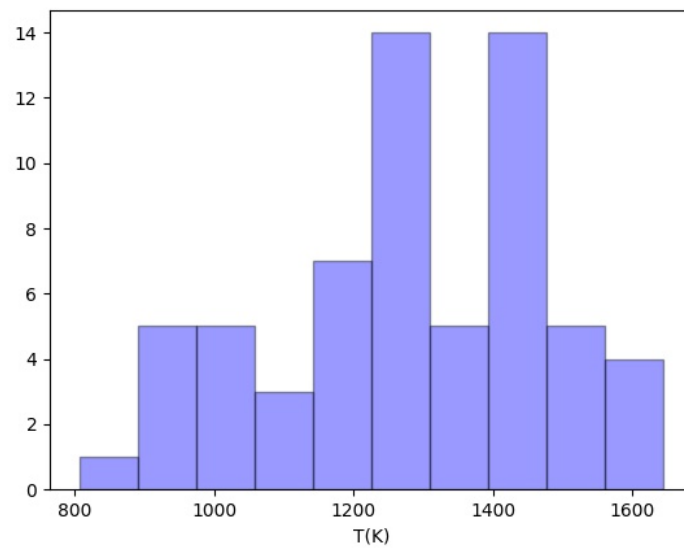


Figure 28: Histogram of Temperature

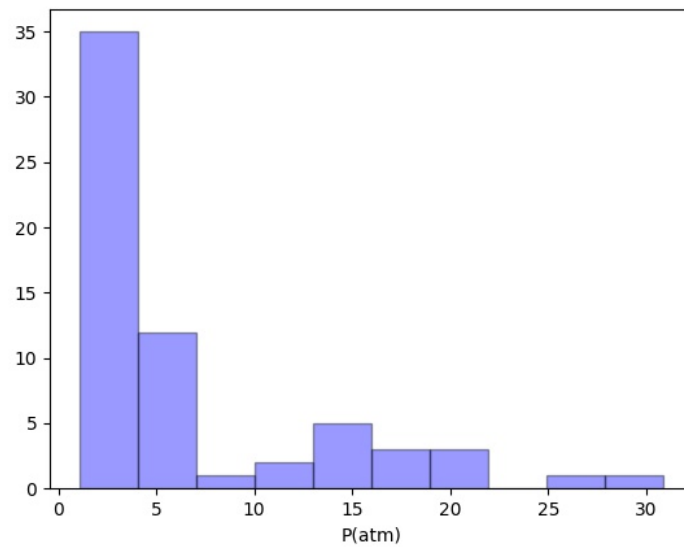


Figure 29: Histogram of Pressure

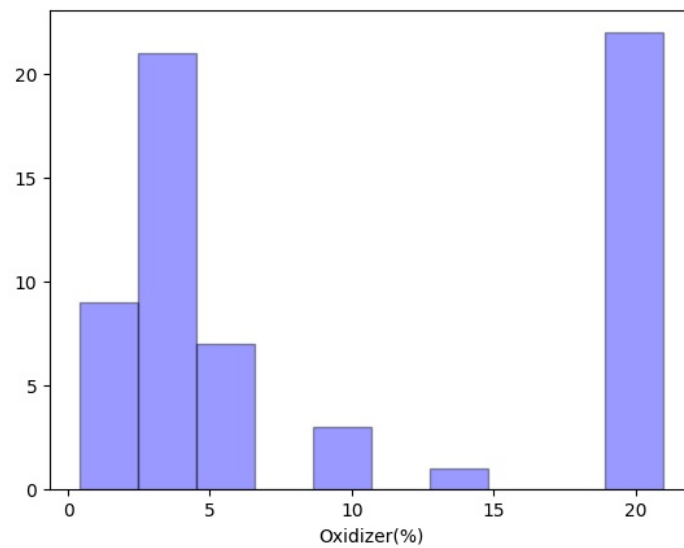


Figure 30: Histogram of Oxidizer

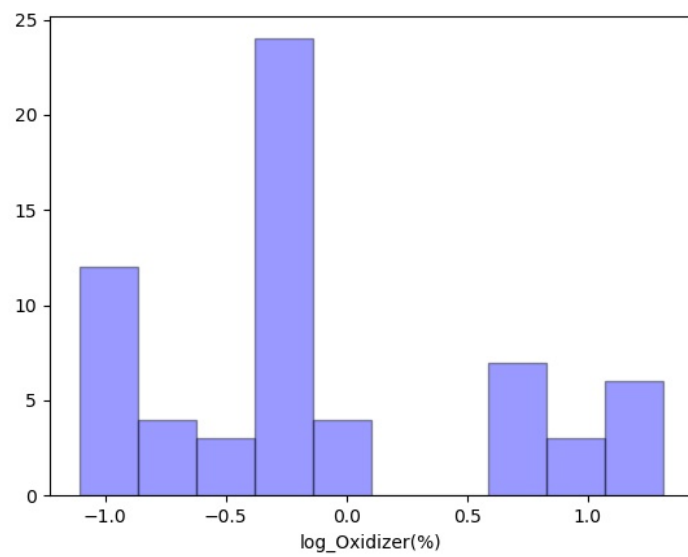


Figure 31: Histogram of log Oxidizer

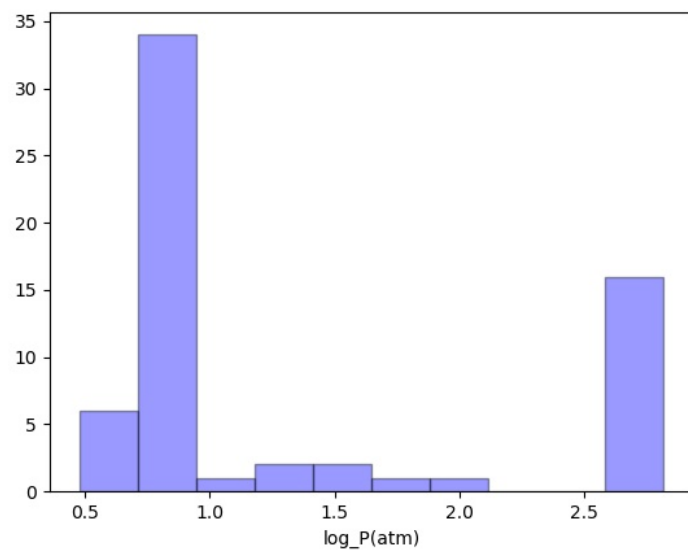


Figure 32: Histogram of log Pressure

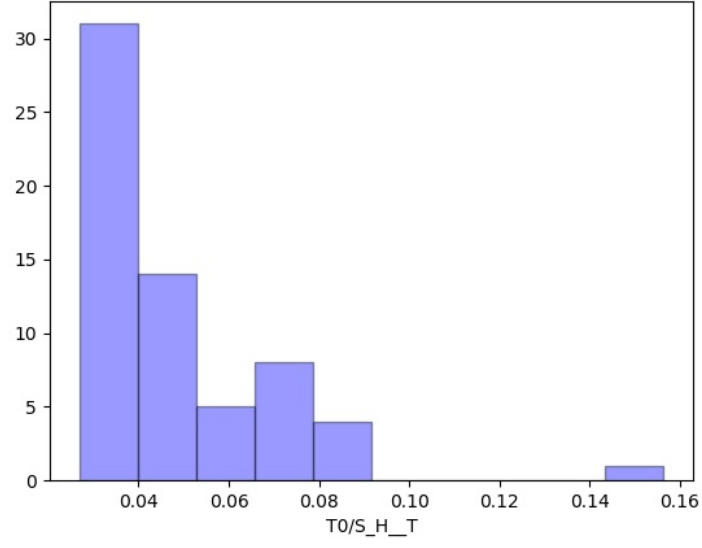


Figure 33: Histogram of  $T_0$  by CSH  $T$

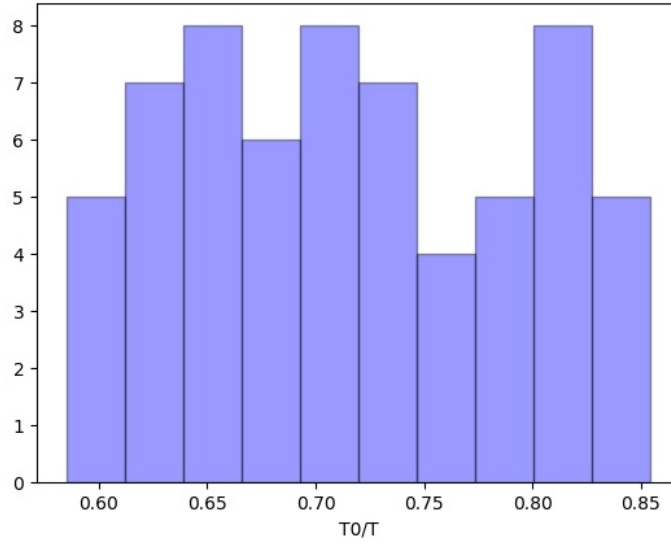


Figure 34: Histogram of  $T_0$  by  $T$

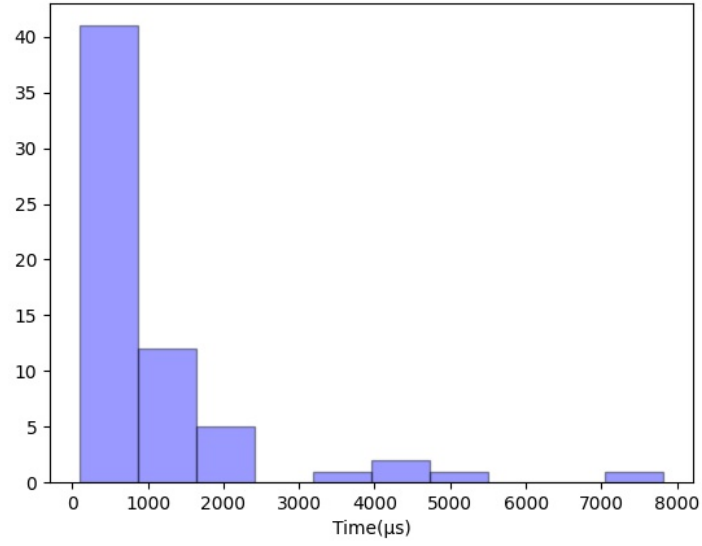


Figure 35: Histogram of time

#### 1.1.4 Combined parameter of clusters - only histogram

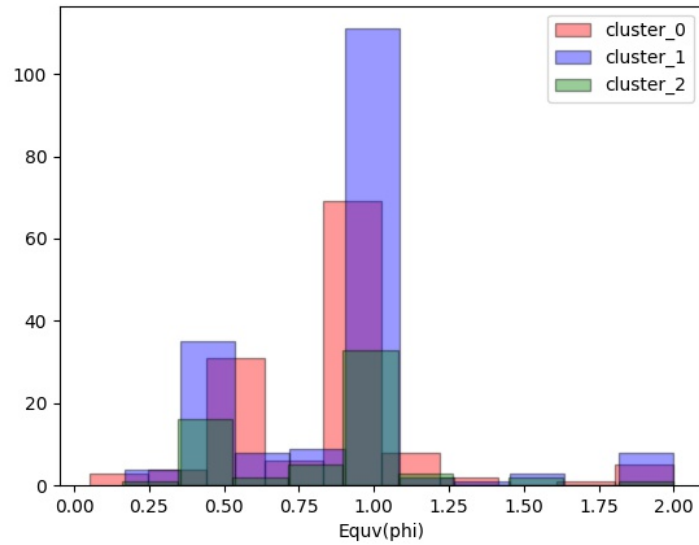


Figure 36: Histogram of Equv( $\phi$ )



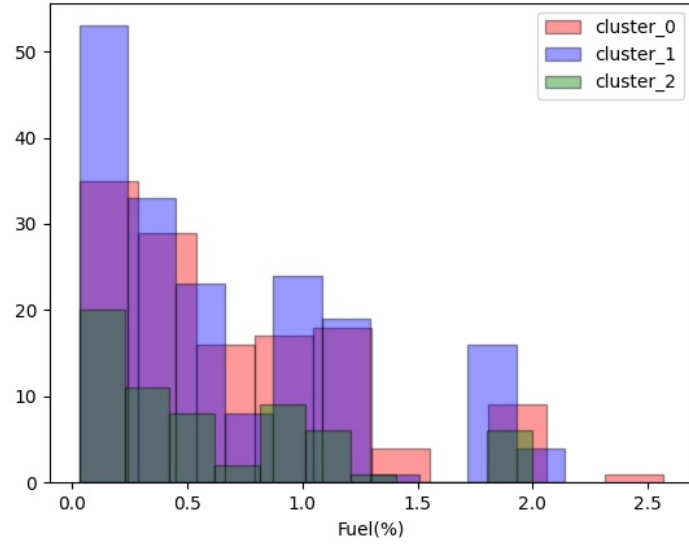


Figure 37: Histogram of Fuel(%)

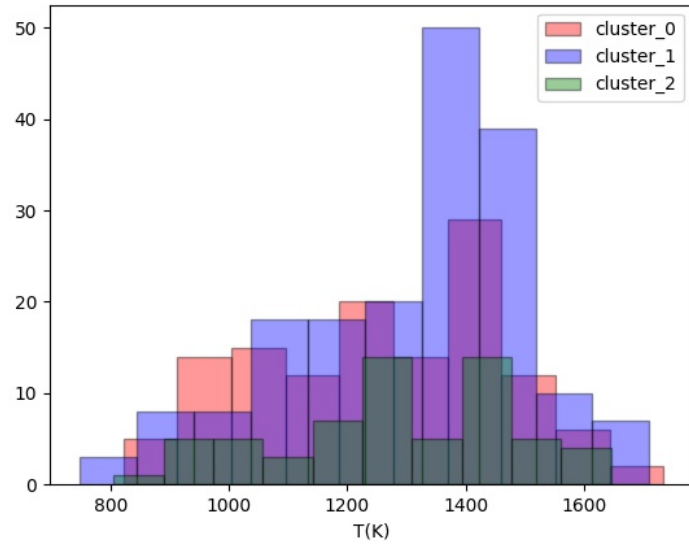


Figure 38: Histogram of Temperature

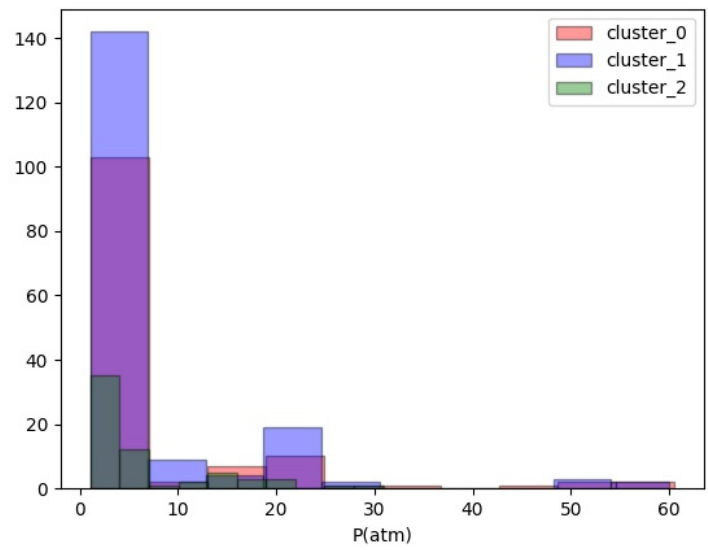


Figure 39: Histogram of Pressure

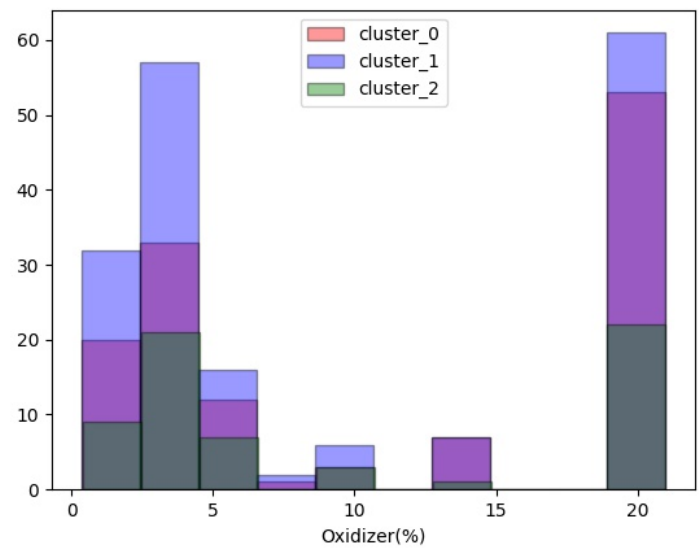


Figure 40: Histogram of Oxidizer

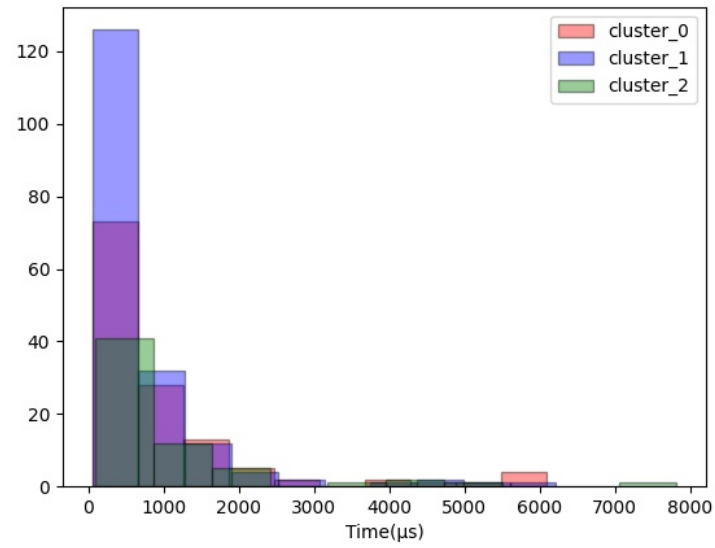


Figure 41: Histogram of time

### 1.1.5 Combined parameter of clusters - histogram and pdf

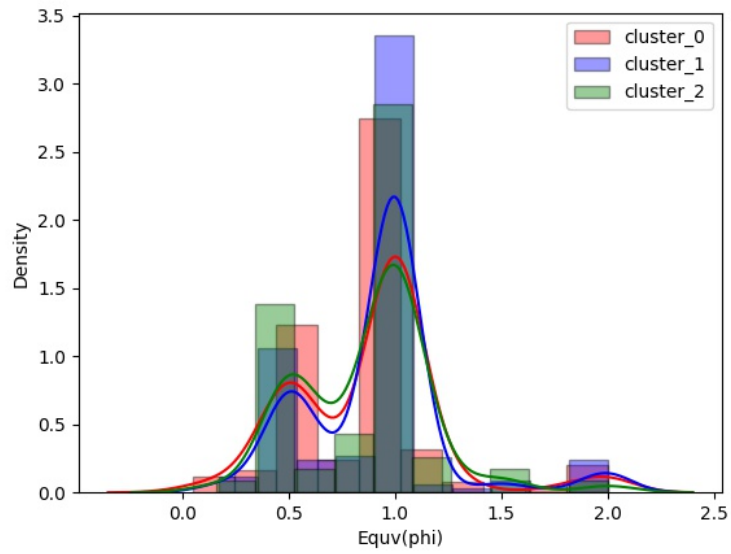


Figure 42: Histogram of  $\text{Equv}(\phi)$

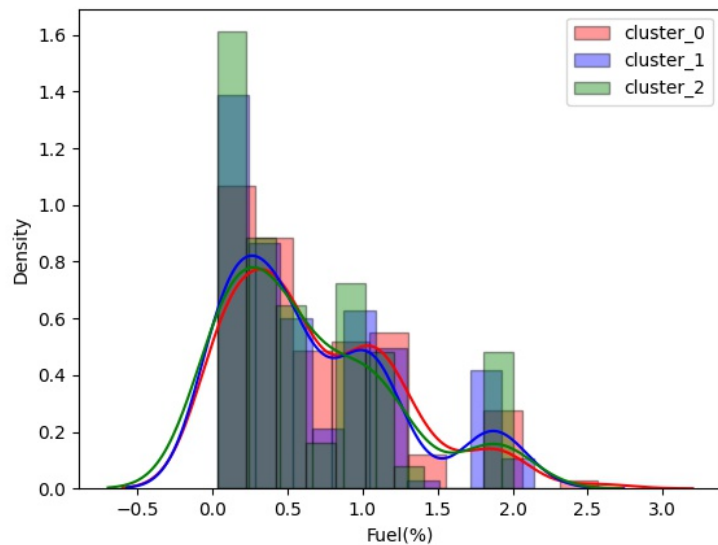


Figure 43: Histogram of Fuel(%)

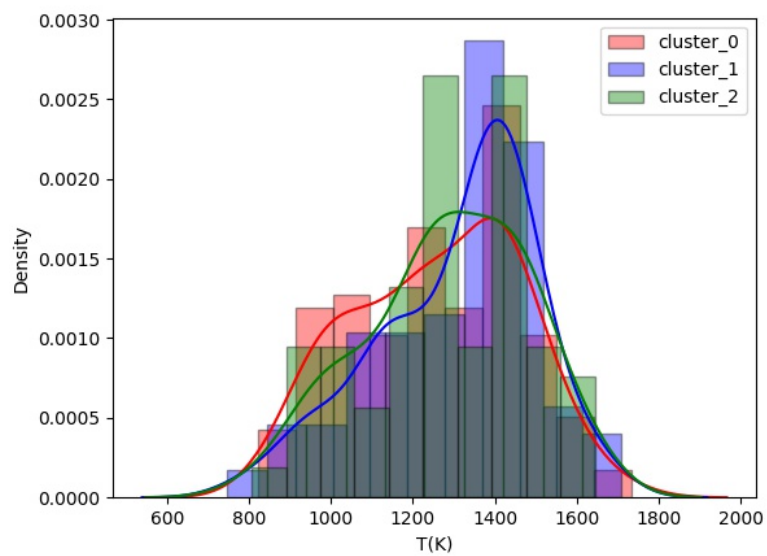


Figure 44: Histogram of Temperature

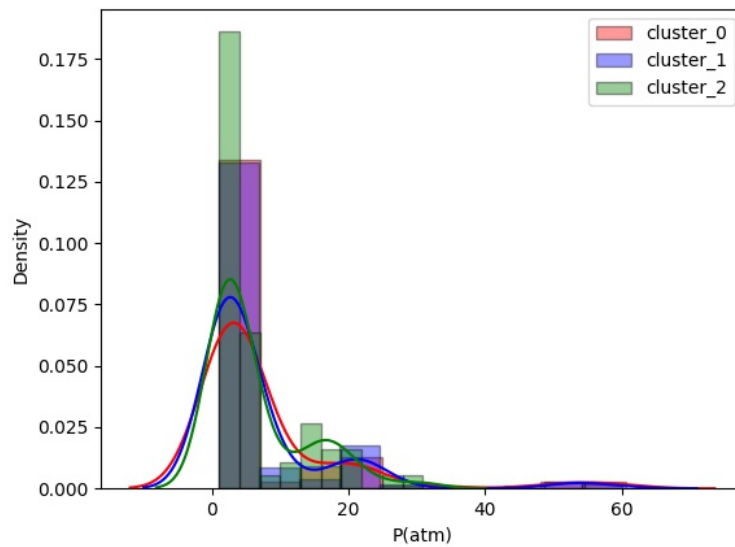


Figure 45: Histogram of Pressure

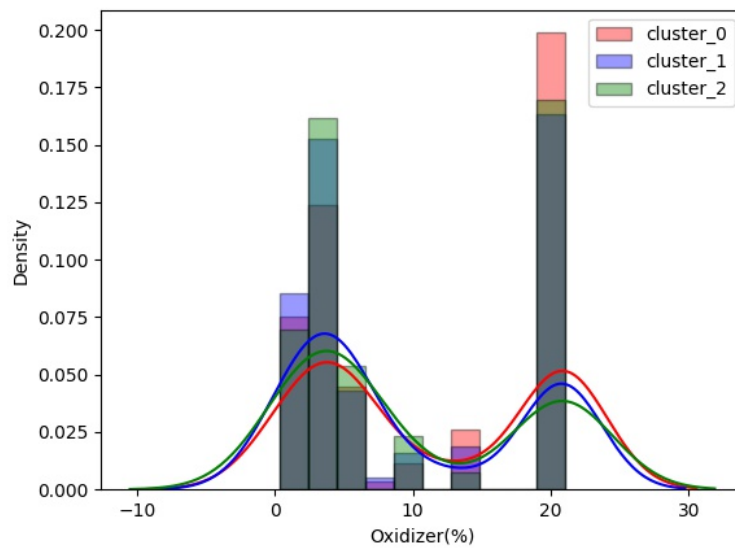


Figure 46: Histogram of Oxidizer

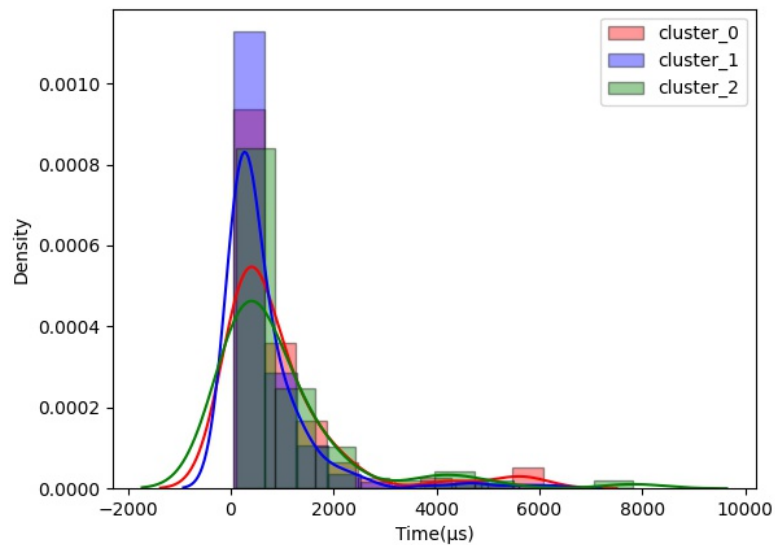


Figure 47: Histogram of time

### 1.1.6 Histogram of Pressure for each fuel combining all cluster

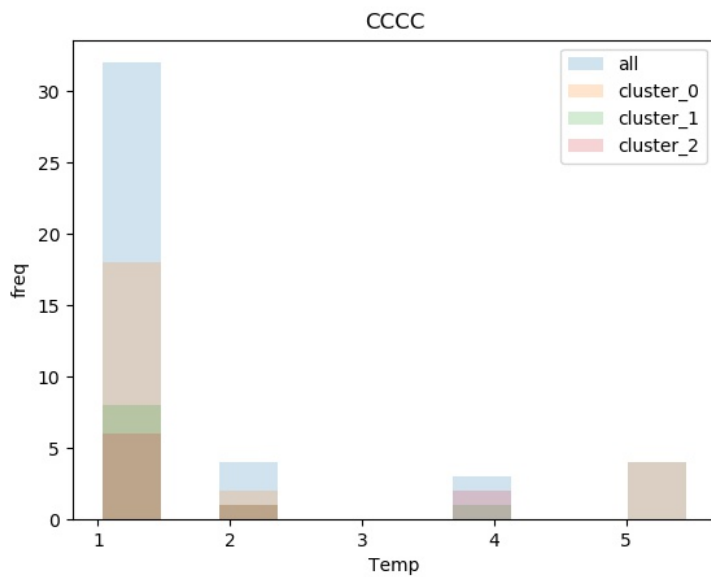


Figure 48: Histogram of Butane combining each cluster

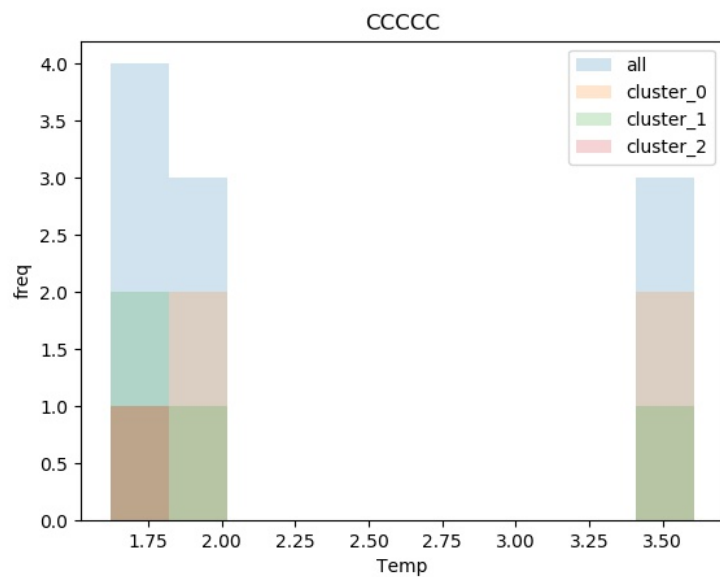


Figure 49: Histogram of Pentane combining each cluster

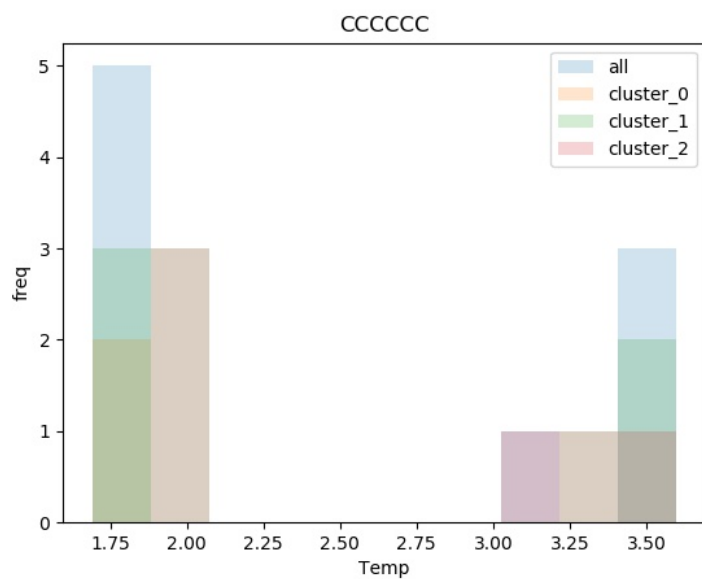


Figure 50: Histogram of Hexane combining each cluster



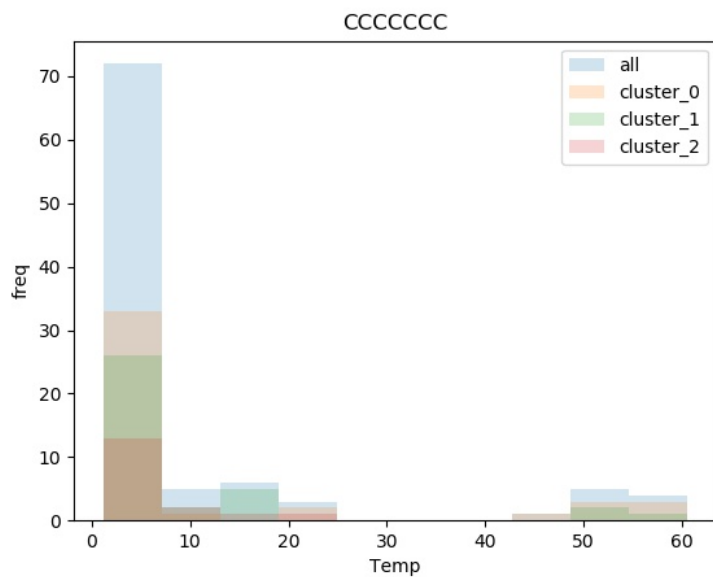


Figure 51: Histogram of Heptane combining each cluster

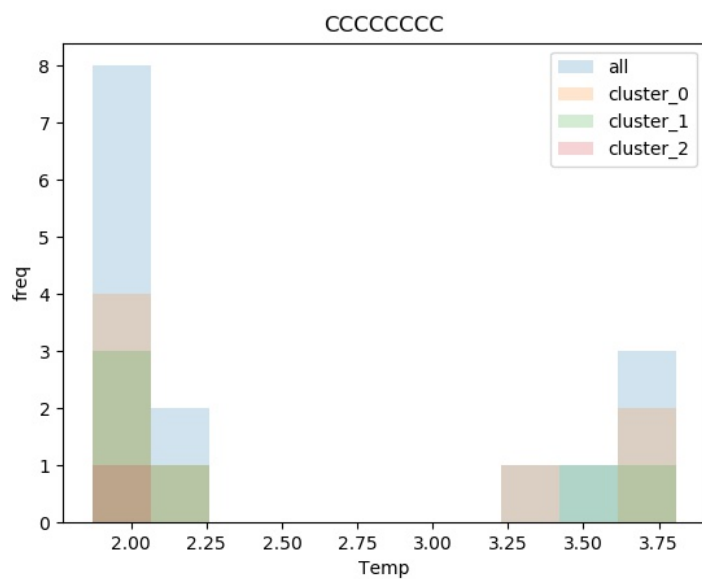


Figure 52: Histogram of Octane combining each cluster

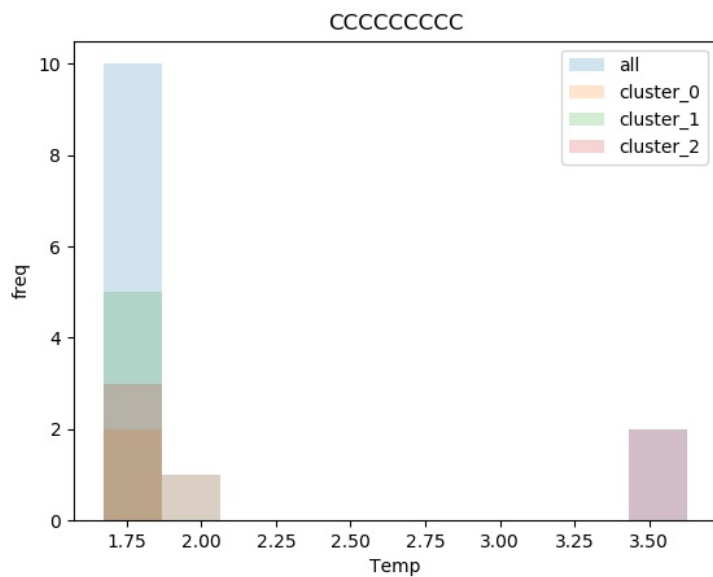


Figure 53: Histogram of Nonane combining each cluster

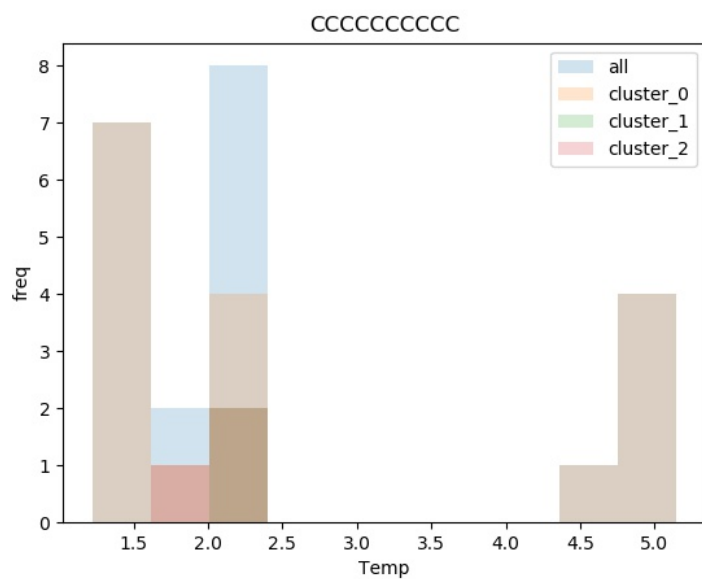


Figure 54: Histogram of Decane combining each cluster

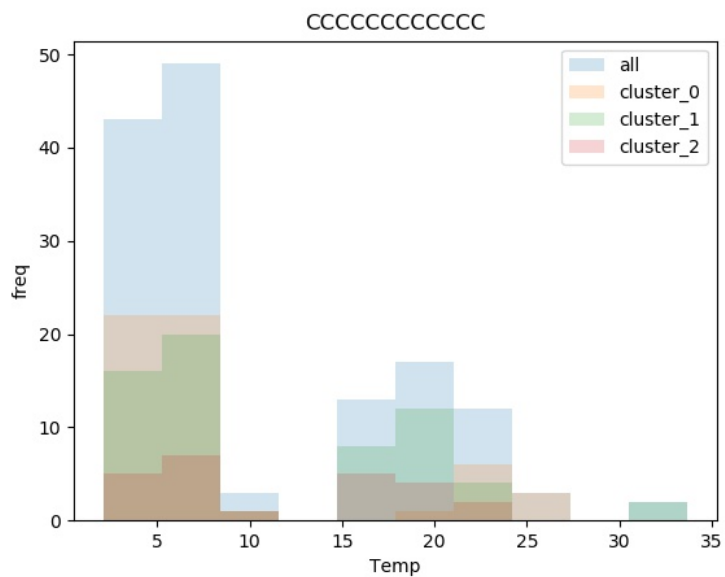


Figure 55: Histogram of Dodecane combining each cluster

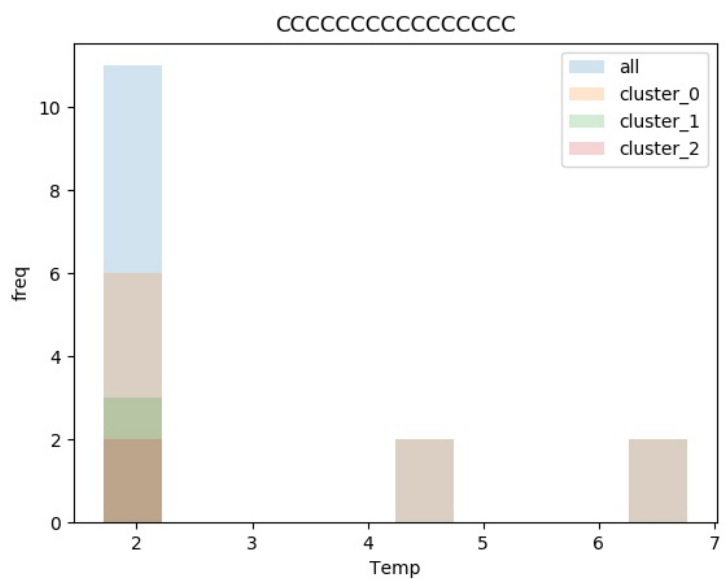


Figure 56: Histogram of Hexadecane combining each cluster

### 1.1.7 Histogram of temperature for each fuel combining all cluster

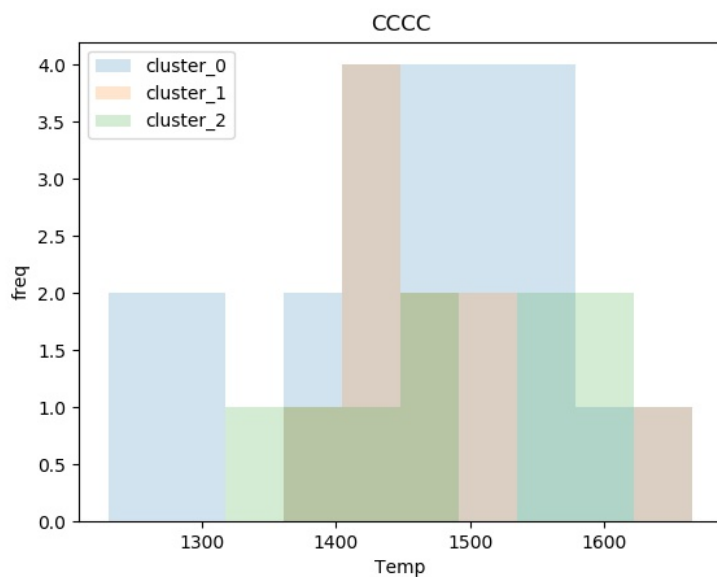


Figure 57: Histogram of Butane combining each cluster

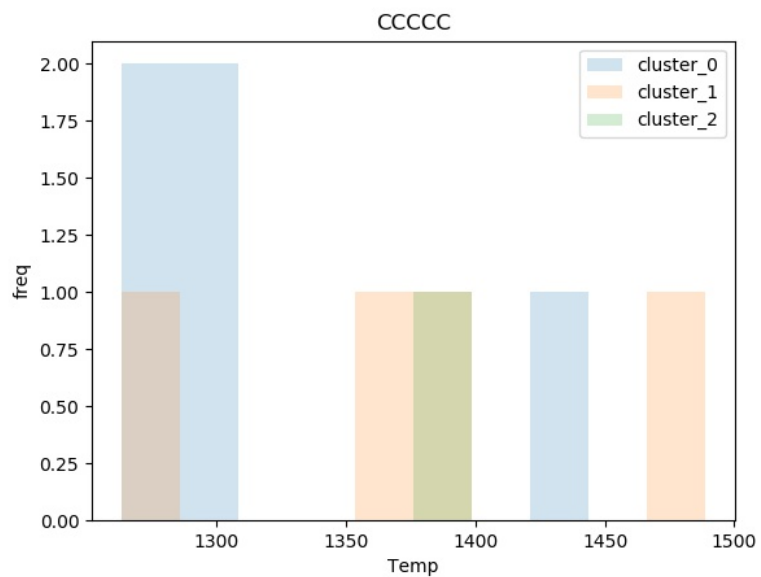


Figure 58: Histogram of Pentane combining each cluster

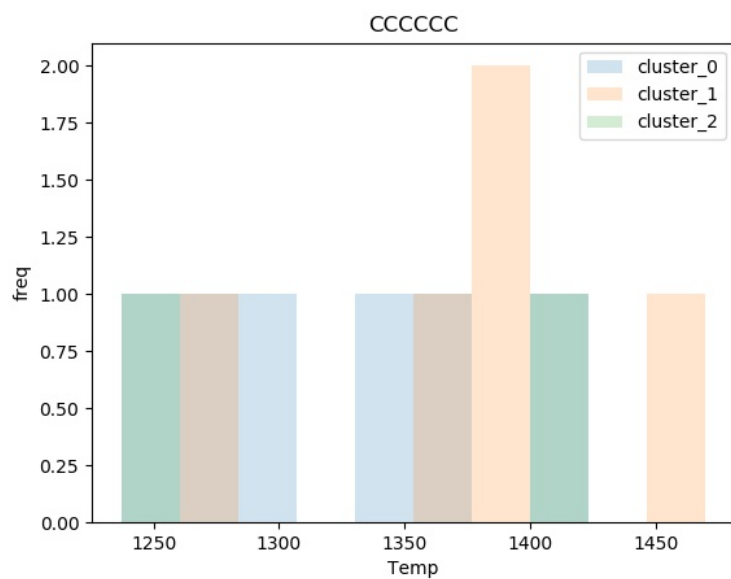


Figure 59: Histogram of Hexane combining each cluster

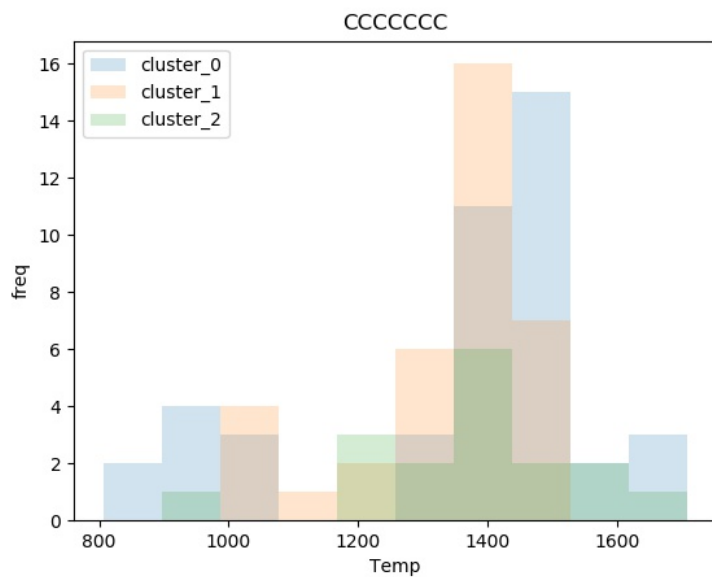


Figure 60: Histogram of Heptane combining each cluster

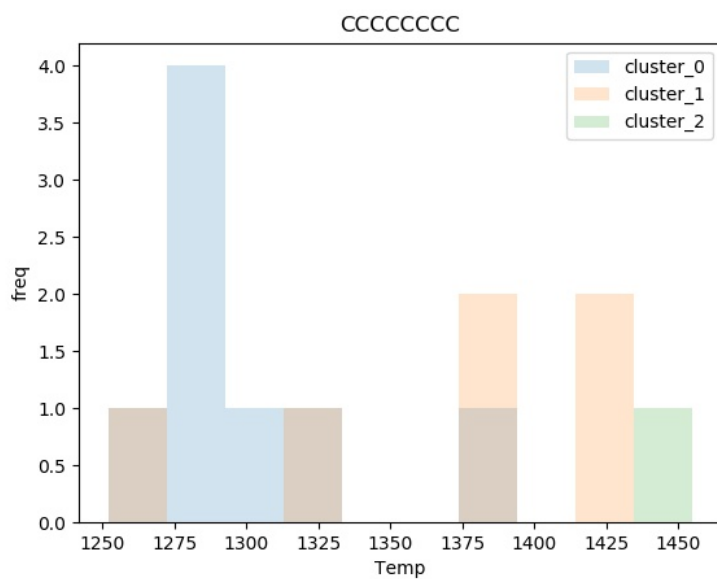


Figure 61: Histogram of Octane combining each cluster

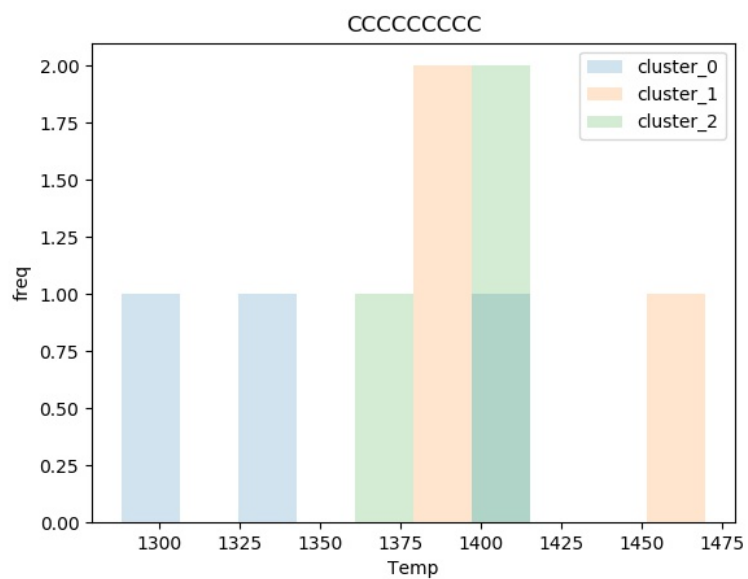


Figure 62: Histogram of Nonane combining each cluster

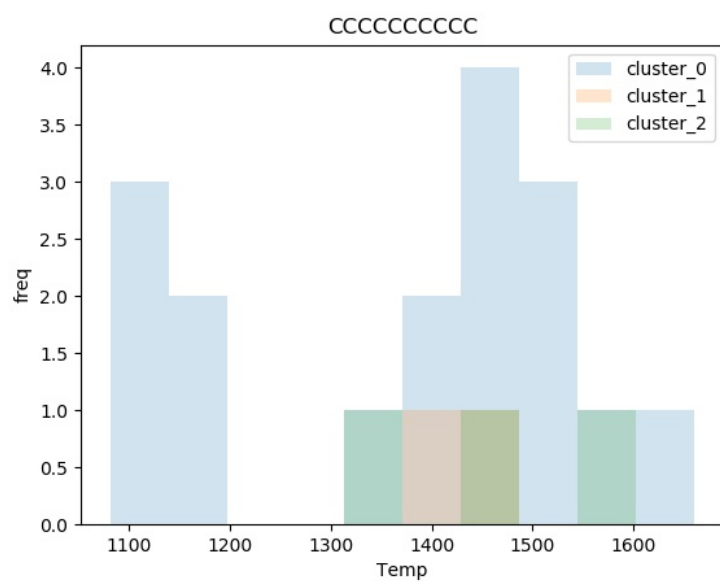


Figure 63: Histogram of Decane combining each cluster

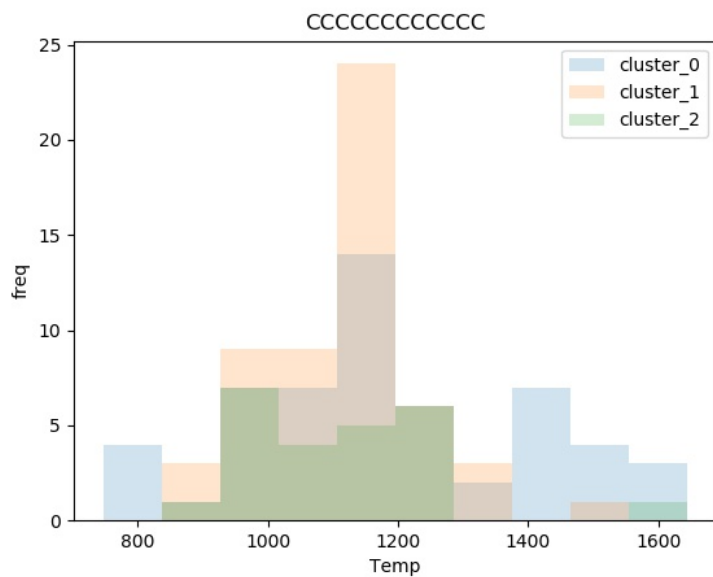


Figure 64: Histogram of Dodecane combining each cluster

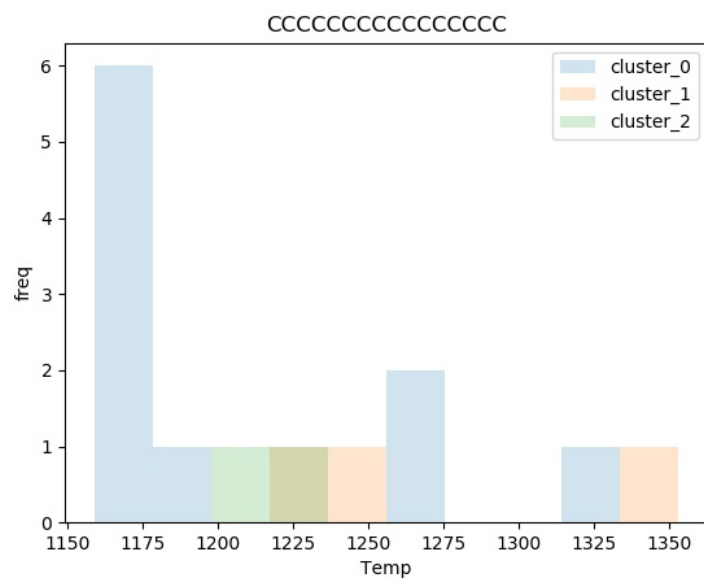


Figure 65: Histogram of Hexadecane combining each cluster