



กรมโรงงานอุตสาหกรรม  
DEPARTMENT OF INDUSTRIAL WORKS

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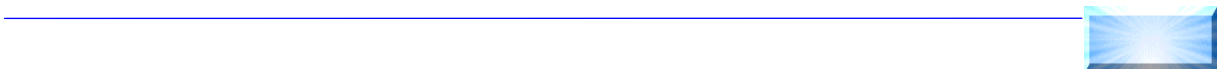
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# « ภาศที่ 1 »

1.1

1.2

1.3

1.4

1.5

1.6

1.7

1.8

1.9           Flashover

1.10           Backdraft

1.11

1.12



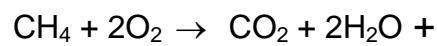
# 1

## 1.1

(Oxidation)

นิยามของปฏิกิริยาออกซิเดชัน คือ ปฏิกิริยาทางเคมีที่เกิดระหว่างสารใดๆ กับออกซิเจน และทำให้เกิดมี ความร้อนเกิดขึ้น และความร้อนที่เกิดจากกระบวนการเผาไหม้นี้ จะเป็นแหล่งความร้อนซึ่งเป็นปัจจัยสำคัญ ที่ทำให้การลุกไหม้ของไฟดำเนินไปอย่างต่อเนื่อง

ตัวอย่างของปฏิกิริยาการเผาไหม้ที่มีมีเทน (CH<sub>4</sub>) เป็นเชื้อเพลิง



(Mid-Range Reaction)

(Corrosion)

## 1.2

3

- 1.
- 2.
- 3.

(Chain Reaction)  
(Fire Tetrahedron Theory)  
3

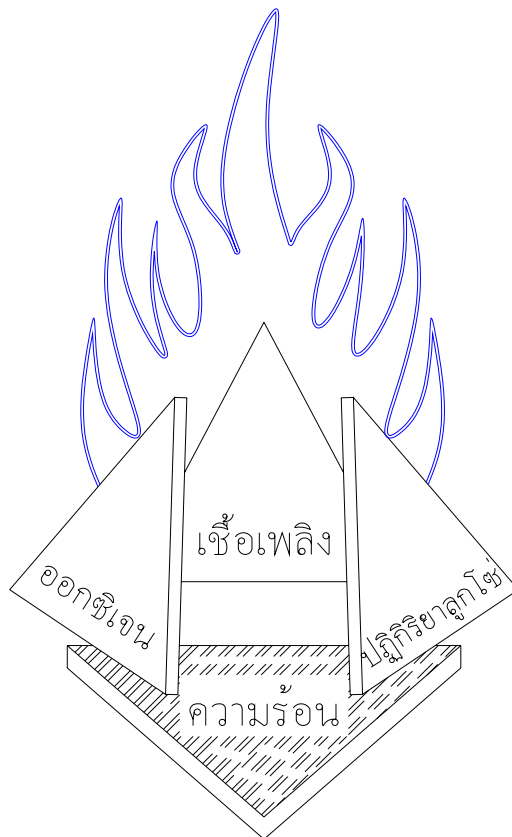
1.2.1

(C)

(H)

(Chain Reaction)

(Fire Tetrahedron)



1.2.1

---

(Fire Tetrahedron)



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**1.3**

**1. (Class A)**

**2. (Class B)**

(Combustible Liquid)

(Flammable Liquid)

(Fluid)

**3. (Class C)**

---

**4 (Class D)**

(Magnesium)

(Titanium)

(Zirconium)

1.4

4

1.

2

3

4

(Fusion)

(Fission)

---

1.5

1.

2

1.1

1.2

(Gas Law)

2

4

2.1

(Conductor)



---

22

23

2

24

3

4

31

32

4

(Uranium)  
(Fission)

(Plutonium)

2

(Fusion)

1.6

1. (Flashpoint)

Sustained Combustion)

(Self-

2 (Ignition Temperature Fire Point)

---

**3 (Auto-Ignition Temperature)**

**4 (Flammable Range or Explosion Range)**

(Flammable Vapour)		(Flammable Gas)	
(Upper Flammable Limit )	(Lower Flammable Limit)	Upper Explosive Limit (UEL)	Lower Explosive Limit (LEL)
(LFL)	1.5		(UFL)
7.5		1.5	7.5
1	10		

**5**

	(Flame Spread)	(Smoke Production)
		2
1.	(Flexible Solid)	
2.	(Structural Solid)	

---

3

51

52

53

1.7

## 1. (Vapor Pressure)

(Atmospheric Pressure)

	(mmHg)	(psi)	(Atmospheres (atm))
		760	
	38		(Kerosene) 5
21		(Toluene) 20	
		(Ethyl Acetate) 73	20

---

2

**(Vapor Density)**

1

1

1

1

1

(Flammable Liquid Vapor)

(Flammable Gas)

1.6

(Acetylene)

0.907

3

**(Specific Gravity)**

1

1

1

4

**(Solubility)**

1

(Isopropyl Alcohol)

1

---

**1.8**

4

- 1.
2. (Convection)
3. (Radiation)
4. (Conduction)

**1.**

(Incipient Stage)

**2**

**(Convection)**

(Developed Stages)

( )

---

3

(Radiation)

( )

4

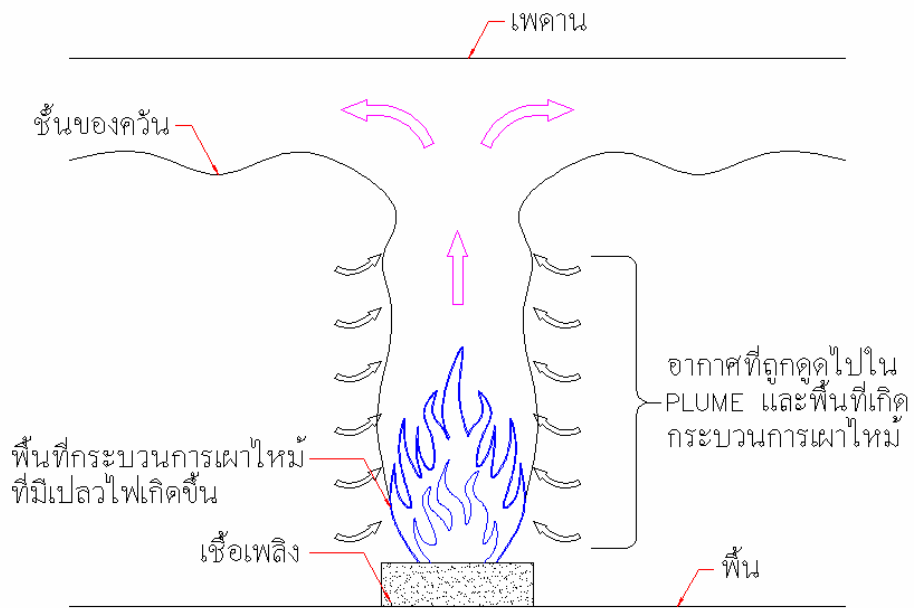
(Conduction)

1.9

Flashover

Flashover

(Enclosed Space)



1.9.1

**1.10 Backdraft**

Back Draft (Smoke Explosion)

(CO)

2

Backdraft

**1.11**

4



---

1.

2

3

4

41 (Carbon Dioxide, CO<sub>2</sub>)

42 (Carbon Monoxide, CO)

---

Cyanide, HCN)  
Dioxide, NO<sub>2</sub>)

(Sulfer Dioxide, SO<sub>2</sub>)

(Hydrogen  
(Nitrogen

2

1.12

4

1.

(Flashpoint)

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2

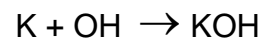
2

3

4

Affinity)

(Highly



1

2

1

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# « ភាគទី 2 »

21

22

23



( 2.1.1)

1.

2

(Direct-Fired)

65

3

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18,000

4

41

42

43

44

(Bucket Elevator)

( )

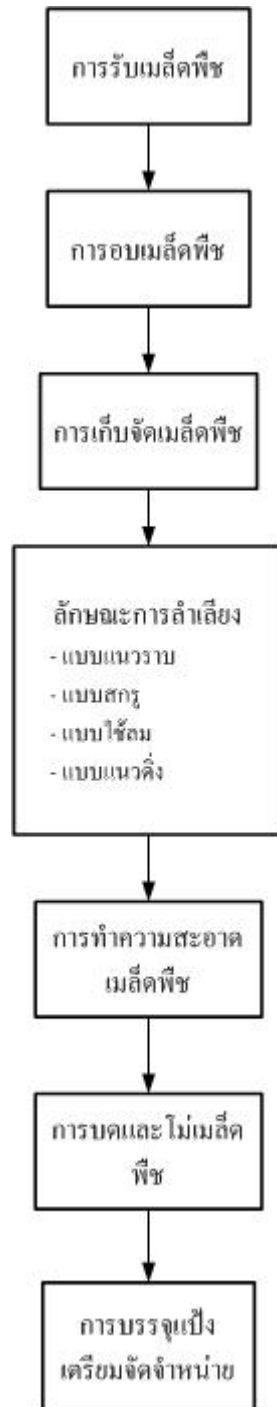


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5

6

7.



2.1.1



		<p>2.</p> <hr/> <p>1.</p> <p>2.</p> <p>3.</p> <hr/> <p>NFPA 51B, 69, 70</p>	<p>: 23</p> <p>( 4)</p> <hr/> <p>:</p> <p>1</p> <p>2.5</p> <p>: 45</p> <hr/> <p>:</p> <p>:60</p> <p>( 5)</p>
3.		<hr/> <p>1.</p> <p>2.</p> <hr/> <p>NFPA 51B, 69, 70</p>	<hr/> <p>:</p> <p>:4A</p> <p>: 23</p> <p>( 4)</p> <hr/> <p>:</p> <p>1</p> <p>2.5</p> <p>: 45</p> <p>( 4)</p> <hr/> <p>:</p> <p>:60</p> <p>( 5)</p> <hr/> <p>:</p>
		<hr/> <p>1.</p>	<hr/> <p>:</p> <p>: 45</p> <p>( 4)</p> <hr/> <p>:</p> <p>:60</p> <p>( 5)</p> <hr/> <p>:</p>

			( 6)
4		<p>_____</p> <p>1.</p> <p style="text-align: center;">1</p> <p>2.</p> <p>3.</p> <p>_____</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>_____</p> <p>NFPA 51B, 69, 70</p>	<p>_____</p> <p>:</p> <p>( 6)</p>
5.		<p>_____</p> <p>1.</p> <p>2.</p> <p>3.</p>	<p>_____</p> <p>:</p> <p>( 6)</p>

		_____	
		NFPA 51B, 68, 70	
6.		_____	_____
		1.	:
		2.	( 6)
		(Bonding)	_____
		_____	:
		NFPA 68, 77	( 6)
		_____	
		1.	
		2.	
		_____	
		1.	
		_____	
		NFPA 51B, 68,77	
7.		_____	_____
		1.	:
		_____	( 6)
		1.	



		<hr/> NFPA 51B, 68,70	1 2.5 : 45 ( 4) <hr/> : ( 5) <hr/> : ( 6)
10.		<hr/> 1. 3 2. 3. <hr/> 1. 2. <hr/> NFPA 51B, 68, 70	<hr/> : :10A : 23 ( 4) <hr/> : 1 2.5 : 45 ( 4) <hr/> : 1 ( 4) <hr/> : 



		<hr/> 1.  3  2.  3.  4.  <hr/> 1.  2.  <hr/> NFPA 51B, 68, 70	( 5) <hr/> :  ( 6)

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- NFPA 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work 2003 Edition
  - NFPA 68 Guide for Venting of Deflagrations 2002 Edition
  - NFPA 69 Standard on Explosion Prevention Systems 2002 Edition
  - NFPA 70 National Electrical Code® 2005 Edition
  - NFPA 70B Recommended Practice for Electrical Equipment Maintenance 2002 Edition

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22 ( 6)			
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<b>4</b>			
<b>41</b> ( <b>4</b>			
-		23	
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<b>42</b> ( <b>5</b>			
-		(Pull Manual Station)	
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<b>43</b> ( <b>4</b>			
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<b>44</b> ( <b>4</b>			
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-		64	
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