

(2)

2-4.

(300-400 nm) , - (400-500 nm)

Chong<sup>1)</sup>

,  
 NO<sub>2</sub> SO<sub>2</sub> 가  
 가 , SO<sub>2</sub> NO<sub>2</sub>

上田充夫<sup>11)</sup> 가 NO<sub>2</sub> 가 NO<sub>2</sub> 가  
 가 , 가

,  
 NO<sub>2</sub>가

McEwan<sup>3)</sup>

C.I. Fluorescent Brightener 179 C.I.

Disperse Blue 154 NO<sub>2</sub> 가 ,  
 가 (6,000 ppm)  
 , 60

, NO<sub>2</sub> 가  
 . , 2 가  
 , 가

Lawson<sup>12)</sup>  
 NO<sub>2</sub> , NO<sub>2</sub>  
 . NO<sub>2</sub>  
 . , 가  
 steam pressing , ( seam )  
 , 가  
 가 가 . NO<sub>2</sub>  
 , 가 NO<sub>2</sub>  
 가 .  
 ,  
 가 420 nm  
 NO<sub>2</sub>가 가  
 가 가  
 가 . NO<sub>2</sub> gas가  
 NO<sub>2</sub>가 가,  
 .  
 .

2-5.

2가 .  
 1 PE PP  
 carton box 가

·  
·  
film 가  
가  
, 가 가 NO<sub>2</sub>  
gas가  
film

·  
mechanism

가.

(1)

( ) film  
film PP, PE vinylon PP가  
· ,  
, slip , 가 , , 가  
가  
film BHT  
(Butylated hydroxy toluene) , 40%

·

1)

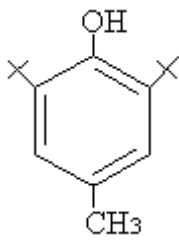
BHT

가

, 0.1-0.5% 가 .<sup>13)</sup> 6

BHT

.



WHITE SOLID

MP 71

BP 147 /20mmHg, 265 /760mmHg

SUBLIMES

WATER INSOLUBLE

< 6> BHT(4-methyl-2,6-di-*tert*-butylphenol,2,6-di-*tert*-butyl-p-cresol, butylated hydroxytoluene)

BHT

가

,

.

< 2> 中 BHT量

| 放置 日數(days) | BHT量(ppm) |
|-------------|-----------|
| 0           | 481       |
| 36          | 353       |
| 69          | 133       |
| 108         | 74        |
| 128         | 36        |
| 163         | 17        |
| (184)       | 490       |

, 25μ, ( ) 100

25μ

BHT

< 2> . 481 ppm

BHT가 BHT

. 100 BHT 가

BHT가 100

.

BHT가 가

.

< 3> BHT

가 .

< 3> BHT ( , 40°C)

| 包装材料  | BHT<br>(g/m <sup>2</sup> · 24hr) |
|-------|----------------------------------|
| 低密度   | 5.12                             |
| 無延伸   | 2.58                             |
| 延伸    | 1.5                              |
| (衣料用) | 1.25                             |

BHT가

. BHT ,

NO<sub>2</sub> 가 .

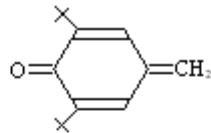
< 4> 差壓法 NO<sub>2</sub> 가

. NO<sub>2</sub> 가

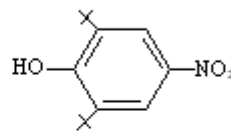
2-3 .

< 4> 가 (差壓法, 25 )

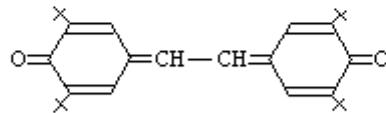
| 包装材料  | (μ) | 가<br>(cc · atm/m <sup>2</sup> · 24hr) |       | (g/m <sup>2</sup> · 24hr) |
|-------|-----|---------------------------------------|-------|---------------------------|
|       |     |                                       |       |                           |
| 低密度   | 26  | 23,000                                | 7,500 | 33                        |
| 無延伸   | 22  | 9,400                                 | 5,000 | 14                        |
| 延伸    | 29  | 2,300                                 | 1,600 | 6                         |
| (衣料用) | 24  | 760                                   | 2,800 | 3,000                     |



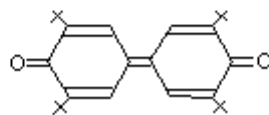
2,6-di-tert-butyl-quinone methide(DBQM)



2,6-di-tert-butyl-4-nitrophenol(DBNP)



3,3',5,5'-tetra-tert-butyl-4,4'-stilbenequinone(TBSQ)



3,3',5,5'-tetra-tert-butyl-4,4'-diphenylquinone(TBPQ)

< 7> Wagner가

2) BHT

NO<sub>2</sub> 가

Hemmpel<sup>14)</sup>

가

, ( , ),

1982 , Wagner<sup>15)</sup> < 7>

3) mechanism

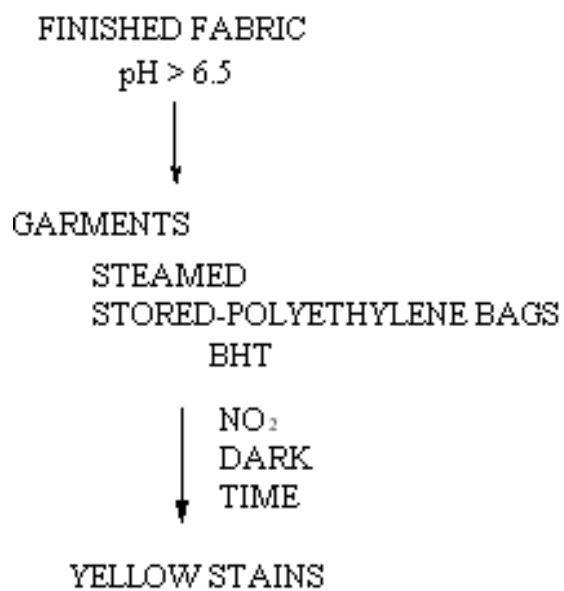
1983 , Kenneth<sup>16)</sup>

BHT NO<sub>2</sub> 가 < 8>

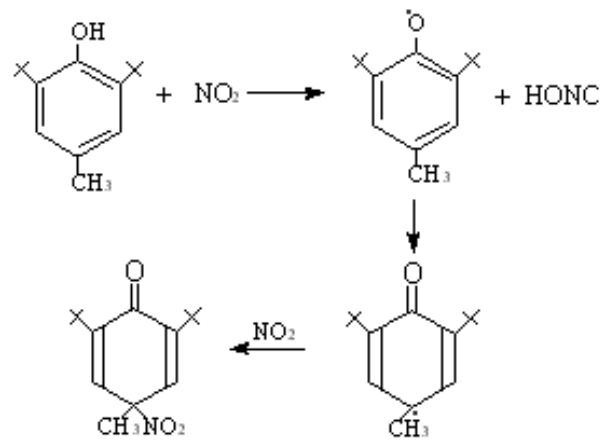
pH가 6.5 , BHT가

BHT가 ,

BHT가 NO<sub>2</sub> 가

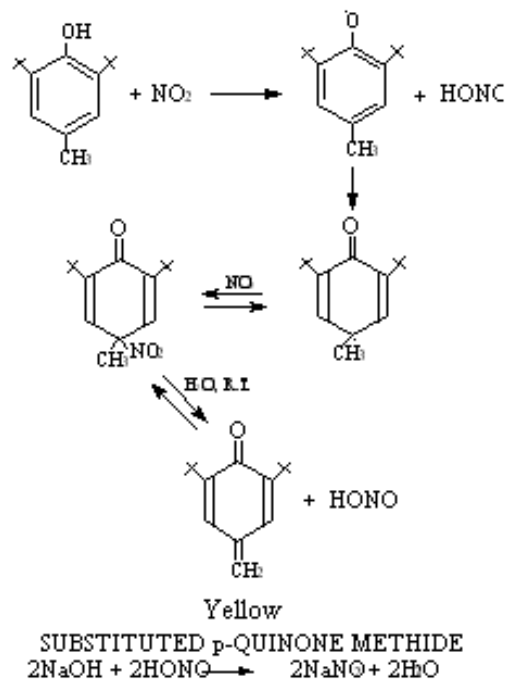


BHT NO<sub>2</sub> 가



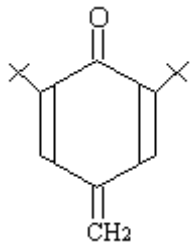
SUBSTITUTED QUINONITROLE

< 9> BHT NO<sub>2</sub> 가 mechanism



< 10> Quinone methide

BHT가 NO<sub>2</sub> nitrous acid free radical  
 quinoid free radical .  
 NO<sub>2</sub> quinonitrole . quinonitrole 97  
 , , ,  
 stilbene quinone .  
 quinonitrole nitrous acid *p*-quinone methide< 10>  
 . nitrous acid  
 가 .  
 < 11> *p*-quinone methide ,  
 가 .



YELLOW SOLID

M.P. 48-50

STABLE < 10min., R.T.

UNSTABLE IN CONCS. > 0.2%

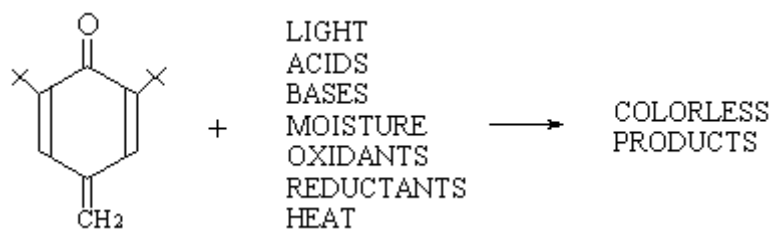
WATER INSOLUBLE

< 11> 3,5-di-*tert*-butyl-*p*-quinone methide

*p*-quinone methide , , 0.2%  
 , 10

. < 12> 가

BHT .

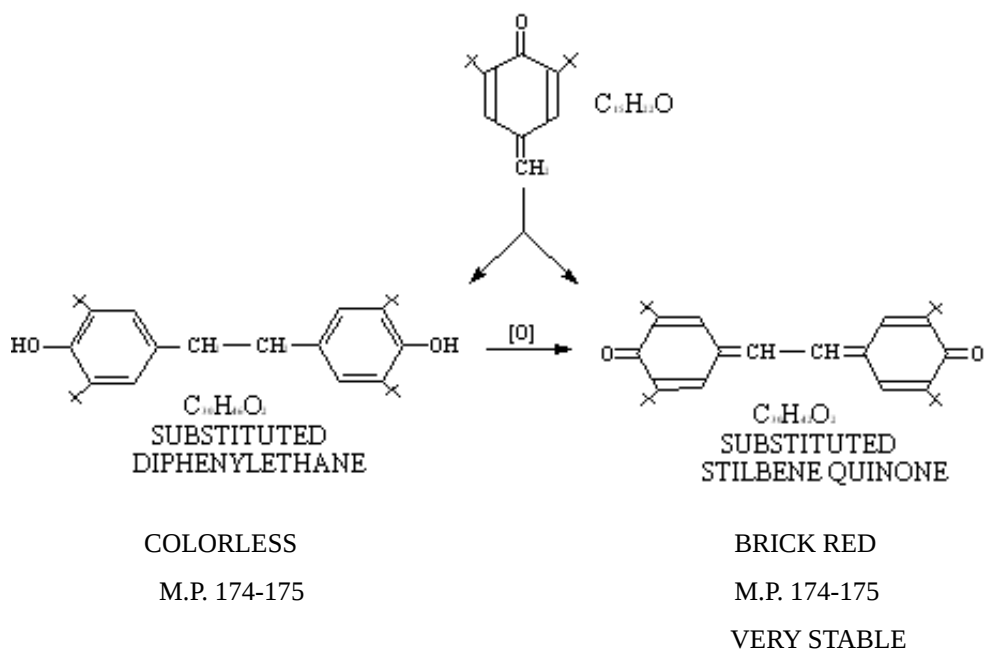


< 12> Quinone methide

*p*-quinone methide

13

dimerize



< 13> 3,5-di-*tert*-butyl-*p*-quinone methide

diphenylethane

가

stilbene quinone

stilbene quinone

(2)

Carton box

가

가

.

,

hydroxy phenyl propane

가

가

.

, ,

가

.

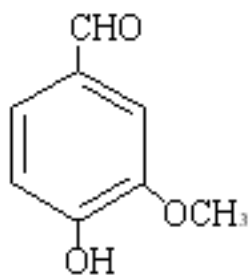
가

가

(4-hydroxy-3-methoxy benzaldehyde) 가

.

1)



needle

B.P. : 285

4-hydroxy-3-methoxy benzaldehyde

2)

< 5> ( , 40 )

|     | (g/m <sup>2</sup> · 24hr) |
|-----|---------------------------|
| PE  | (2.67)                    |
| PE  | 1.10                      |
| PP  | 0.56                      |
| PP  | 0.42                      |
| ( ) | 0.55                      |

( )

BHT

, NO<sub>2</sub> gas

.