

## 1. 생활용품과 계면현상의 응용

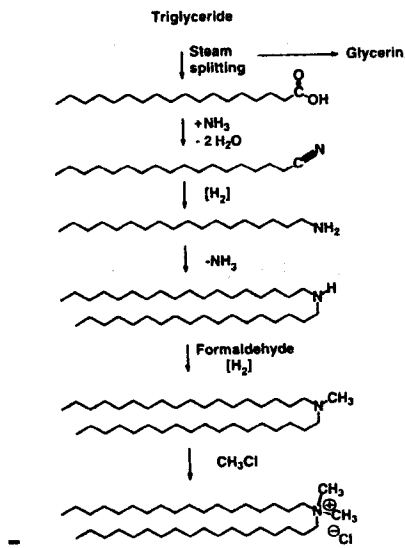
- 세제, 세정제 : 습윤, 침투, 가용화, 분산, 유화, 보호
- 가용화제, 유화제
- 살균, 탈취제 : Quaternary Ammoniums, Betains
- 표면처리제

## 2. Rinse-Added Fabric Treatment - Fabric Softeners

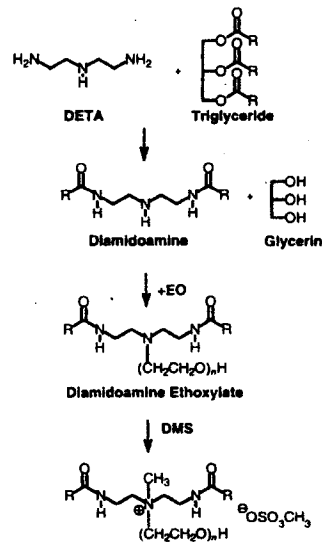
### Benefits of Fabric Softeners?

- Feel Soft
- Freshness : Perfume, Deodor,
- Reduce Static Electricity
- Soil Release
- Anti-Wrinkling
- Easy Ironing
- Fabric Care

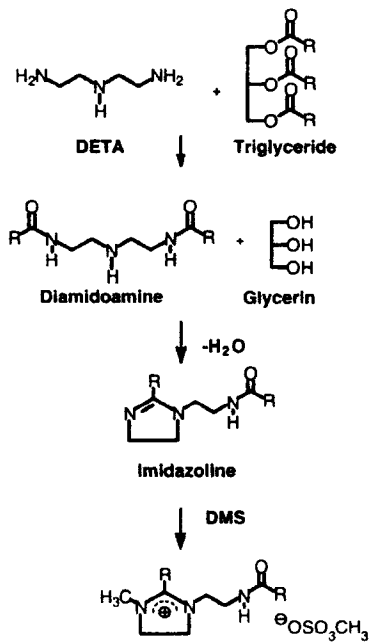
# Cationic Surfactants as Fabric Softener Ingredient



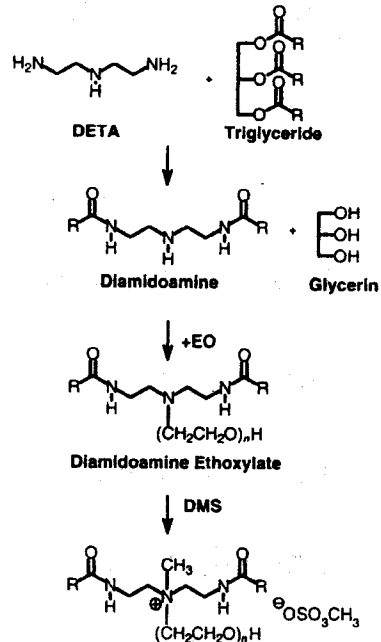
Dialkyl Dimethyl Ammonium Chloride



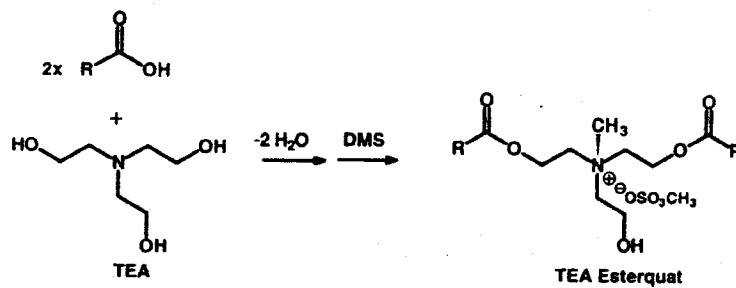
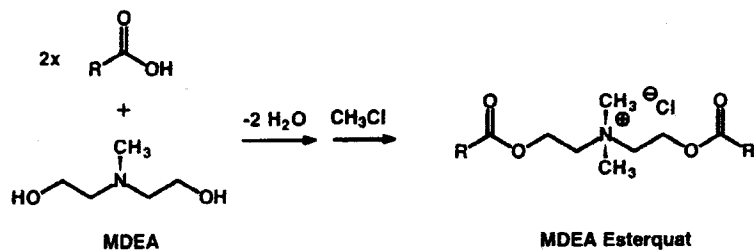
Diamidoamine Ethoxylated Quaternary Ammonium Methosulfate



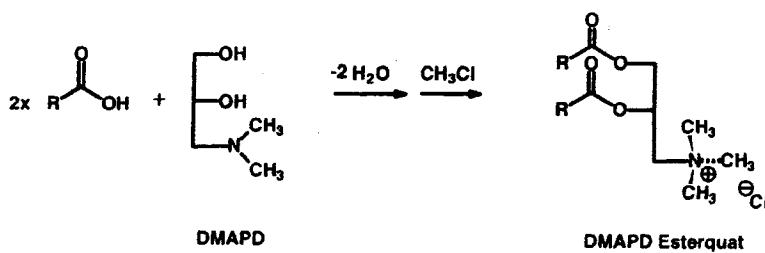
Imidazolinium Quaternary Ammonium Methosulfate



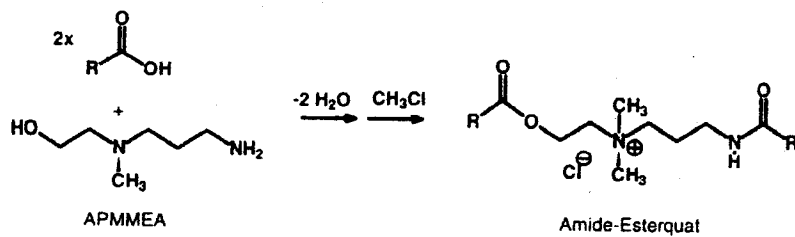
Diamidoamine Hydrochloride



SCHEME 7



SCHEME 8

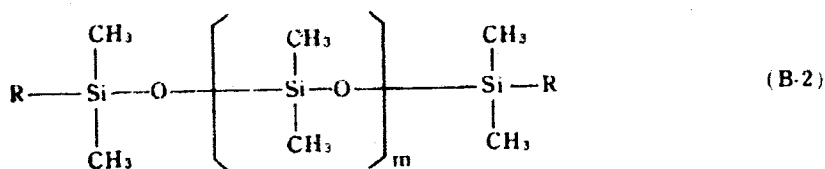
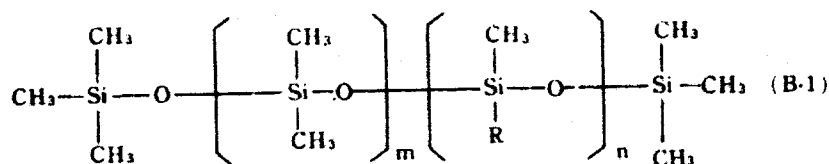
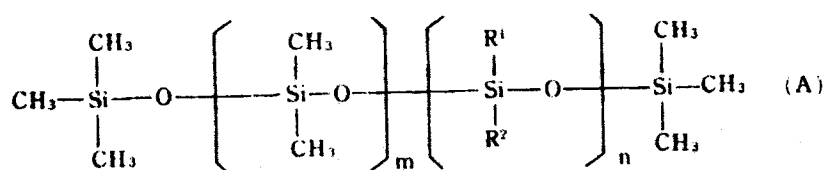


SCHEME 9

## Performance Properties

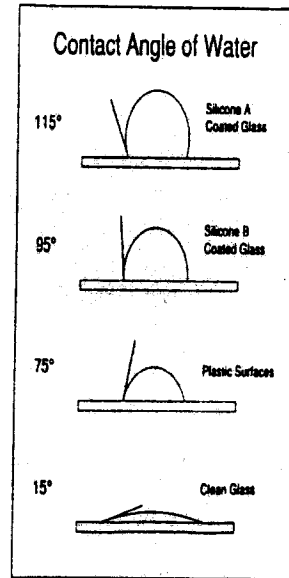
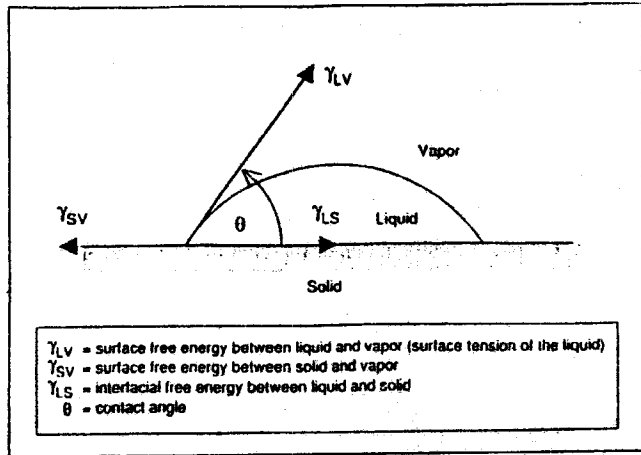
	DDMAC	Diamido amine	Imidazoline	Diester Quat.
Tumble-Dry	+++++	+++	+++	++++
Line-dry	+++++	++++	++++	++++
Rewetting	+	+++	++	++++
Static Control	+++	+++	++++	++++
Nonyellowing	-	+++	++	+++

## Silicones as Fabric Softener Ingredient



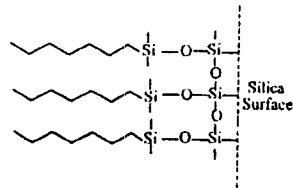
### 3. Glass Treatment : Water Repellent and Anti-Fogging

#### Contact Angle

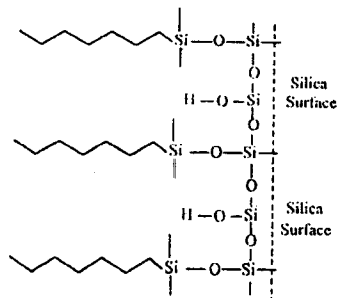


#### Surface Treatment with silicones by Chemical Reaction

Figure 1 A 'Brush' Type Bonded Phase Structure (A)

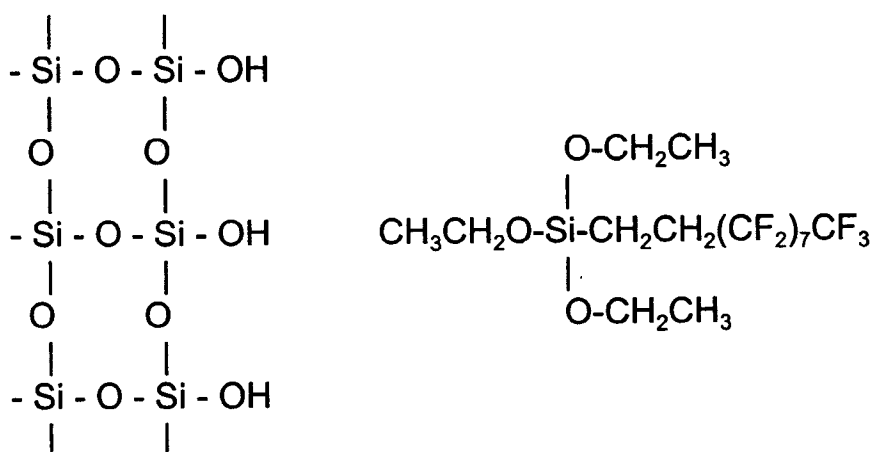


A 'Brush' Type Bonded Phase Structure (B)

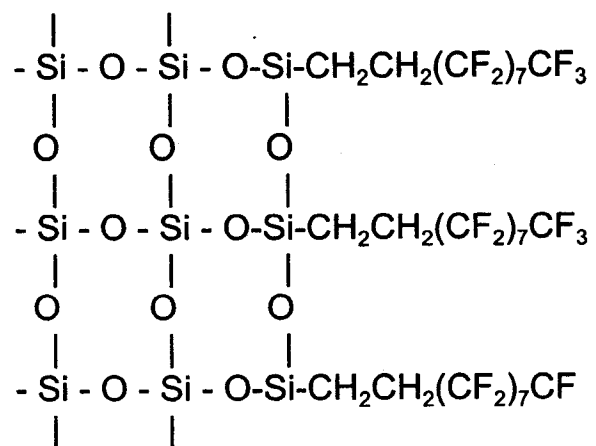


## Surface Treatment with Fluoro-silicones by Chemical Reaction

Before Chemical Reaction

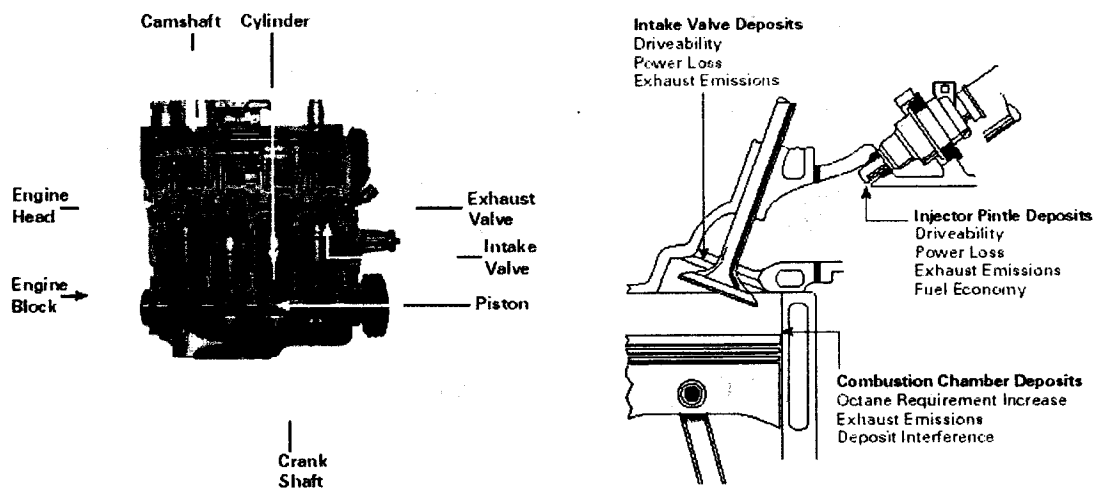


After Chemical Reaction

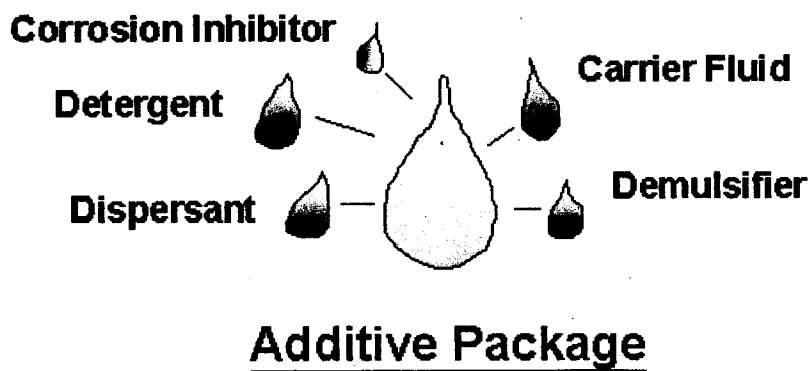


## 4. Fuel System Treatment : Gasoline and Diesel Additives

### Location and Effects of Deposit



### Composition of Multi-purpose Additives

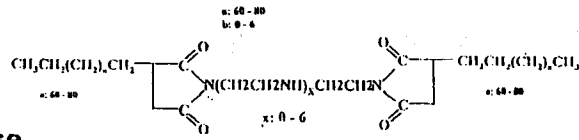


## Detergents and Dispersant for Fuel Additives

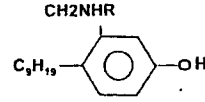
■ PIB-Amine



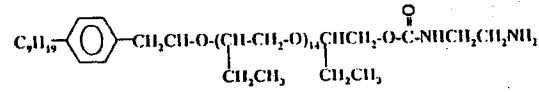
■ PIB-Succinimide



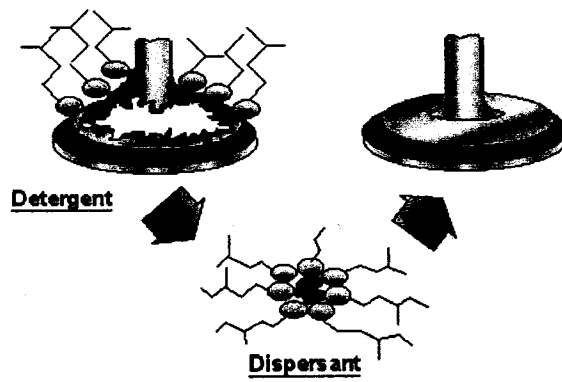
■ PIB-Mannich Base



■ Polyether Amine

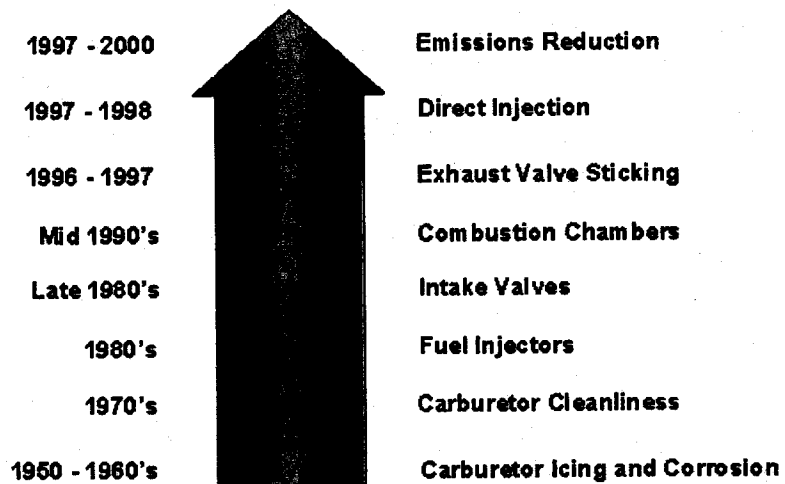


## Detergent and Dispersant Action

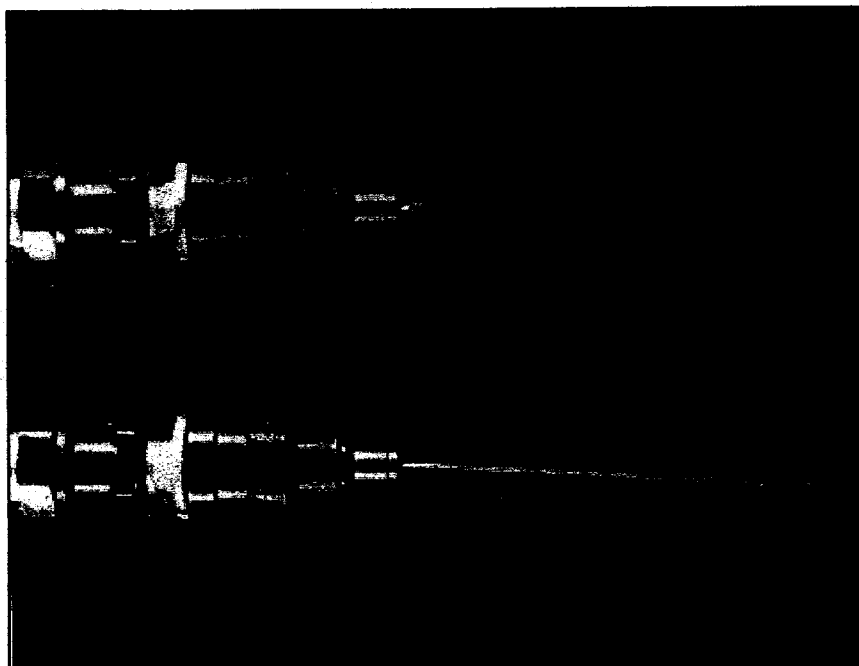




# Additive Development

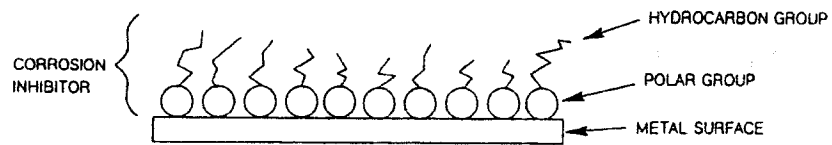


*Evolution of Concerns*

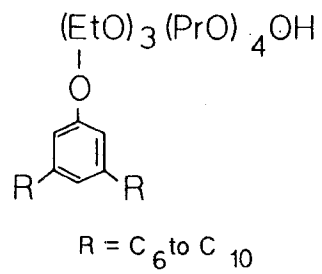




## Corrosion Inhibitors Protecting Metal Surface

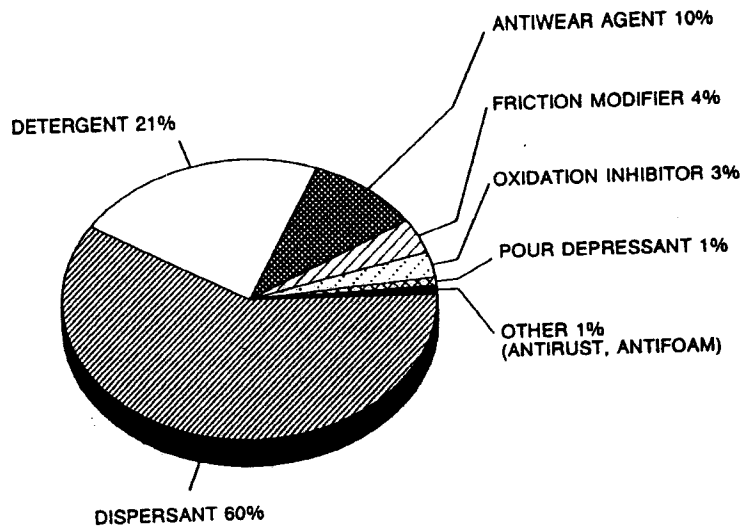


## Chemical Structure of a Typical Demulsifier

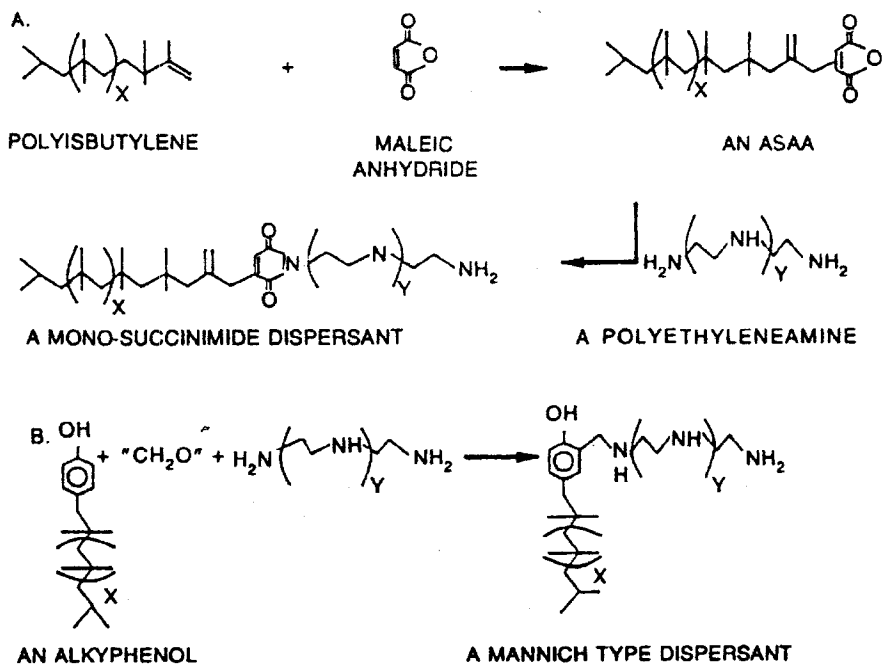


# 4. Engine Oil Additives

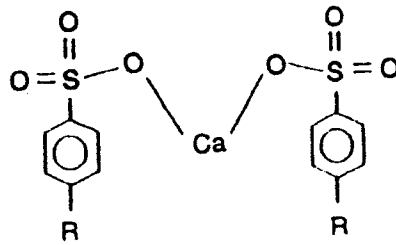
## Additive Package



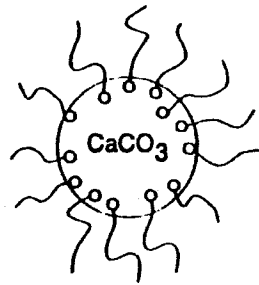
## A Mannich Type Dispersant



## A Overbased Detergent



NORMAL CALCIUM SULFONATE  
(NCS)

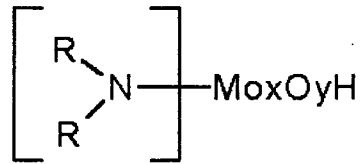
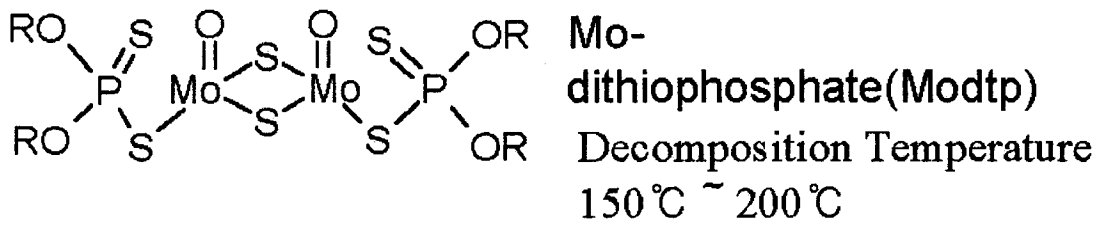


OVERBASED CALCIUM SULFONATE MICELLE  
(WHERE  $\sim\text{o}$  = NCS)

## Anti-Ware and Extreme Pressure Agents

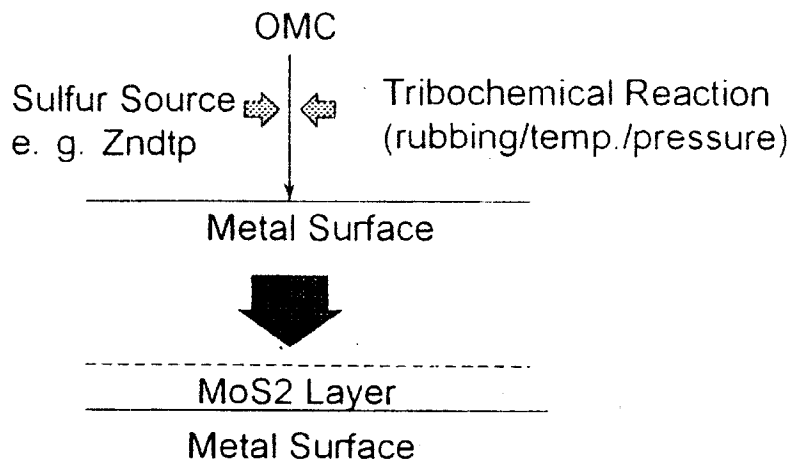
- Anti-Ware Agent
- Extreme Pressure Agent
- Friction Modifiers (Friction Reducers)
- Antioxidants

## Organo-Molybdenum Compounds(OMC)



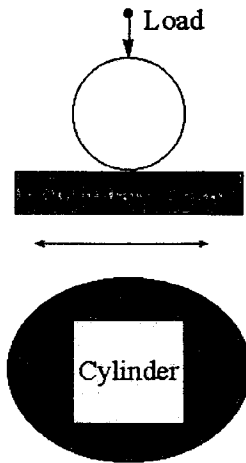
R: Alkyl radical

### Mechanism on Lubrication of OMC on Metal Surface



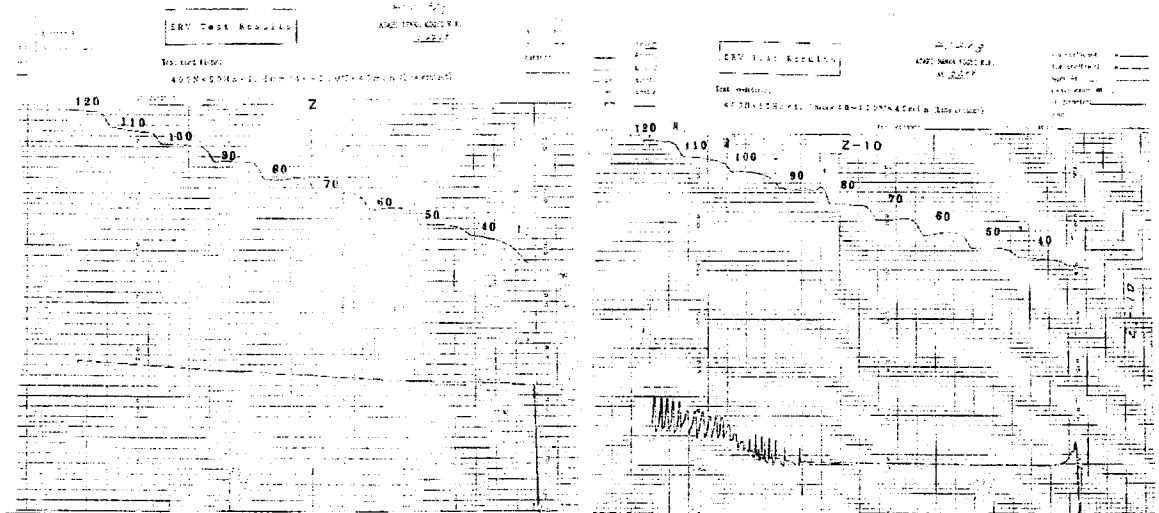
# SRV Test for Friction Coefficient

## SRV Tester



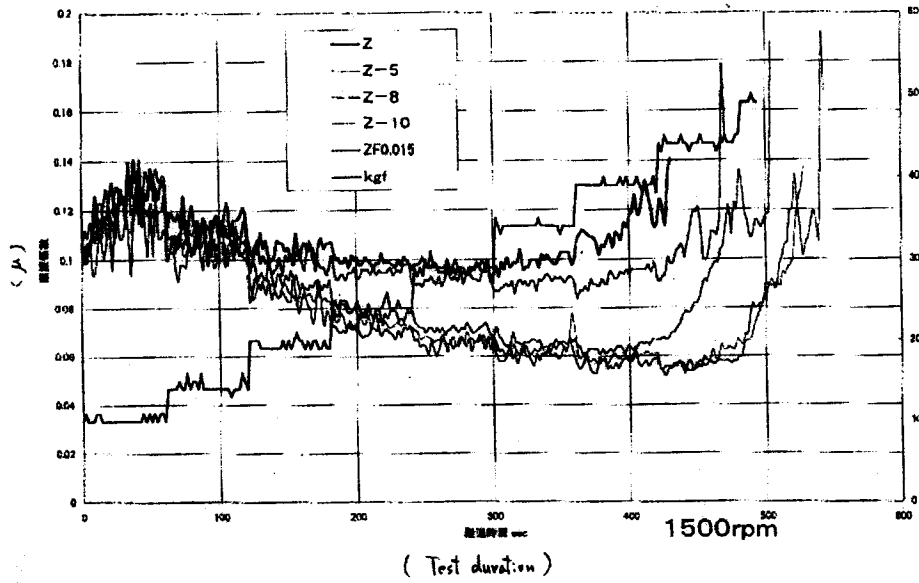
- 1, Load 200 N
- 2, Amplitude 1.0 mm
- 3, Frequency 50 Hz
- 4, Temperature 80 °C
- 5, Test Period 15 min
- 6, Cylinder & Plate
  - Cylinder  $\Phi 15 \times 22$  mm  
SUJ-2(AISI-52100)
  - Plate  $\Phi 24 \times 6.8$  mm  
SUJ-2(AISI-52100)  
Ra=0.16  $\mu$ m
- #Pmax (Hertz Theory)=209Mpa
- #SUJ-2; High Carbon Chromium Bearing Steel (760HV)

## SRV Test Results



# Four Ball Test Results

## 韓国エンジン油



## 韓国エンジン油

