



*New Products for Metalworking and  
Lubrication Applications*

## **Ether Carboxylates (Part I)**

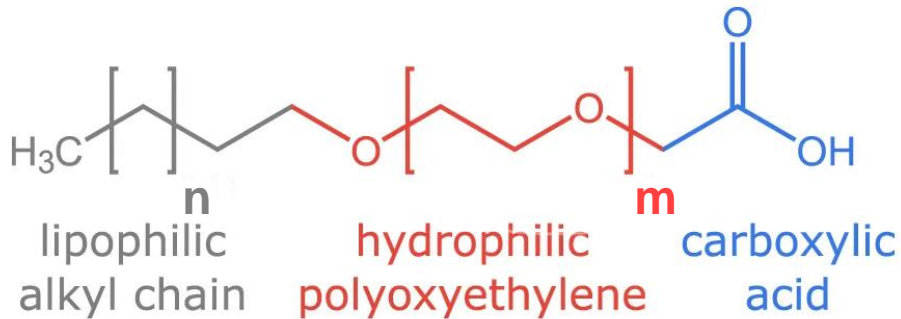


**Colonial  
Chemical**

David Anderson Jr.  
Steven Tang

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# Ether Carboxylates



## Alkyl Chain

*n*-C<sub>4</sub>, variety of C<sub>6</sub> to C<sub>18</sub>

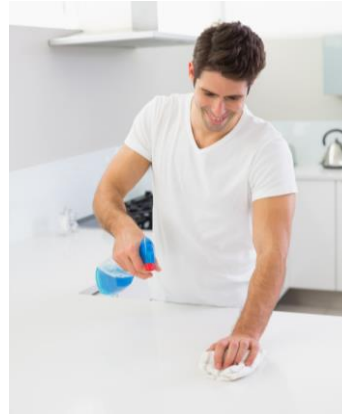
Ethylene oxide units (m): 2 to 10

- Combined nonionic and anionic emulsifiers
- Tunable structure & performance
- Multifunctional
  - Emulsification, dispersing, wetting, corrosion inhibition, lubrication
- Stabilize emulsions against electrolyte and hard water
  - Increased lifetime of water-miscible metalworking fluids
- Low to medium foaming tendency
- Biodegradability

# General Applications - Ether Carboxylates



- Metalworking Fluids
  - Soluble oils
  - Semi-synthetic
  - Rolling emulsions
- Hydraulic fluids:  
HFA-E
- Cleaners
- Crude Oil Recovery
- Personal Care





# Colonial Commercial Products

**Cola<sup>®</sup>Carb B2C**

**Cola<sup>®</sup>Carb BEA**

**Cola<sup>®</sup>Carb O5C**

**Cola<sup>®</sup>Carb TDC**



## Chemistry

- Butoxyethoxy acetic acid
- Short alkyl chain & short EO chain
- Free acid

## Regulatory Listings

- USA (TSCA), Taiwan (NECI)

PROPERTY	ANALYSIS
Appearance @ RT	Clear Liquid
pH (As Is)	1.9
% Moisture (K.F.)	4.7
% NaCl	0.4
Color, Gardner BYK	1.7
Acid Value	257.8



## Performance Attributes

- Low foaming wetting agent
- Stable to high acid and alkali conditions
- Allow formulation flexibility

## Shake Foam Testing

Time	Foam Height (mm)
Immediate	10
@ 1 min	-
@ 5 min	0

HLB	10
K Value	6.3

- Applications
  - Metalworking industrial degreasing
  - Metal cleaners

**B2C as foam suppresser in MWF? Stay tuned!**



## Chemistry

- Sodium salt of Cola<sup>®</sup>Carb B2C
- Short alkyl chain & short EO chain

## Regulatory Listings

- USA (TSCA); Canada (DSL); Japan (ENCS); New Zealand (NZIoC); Korea (ECL); China (IECSC)

PROPERTY	ANALYSIS
APPEARANCE @ 25°C	CLEAR LIQUID
% ACTIVE	46.0 MIN
% MOISTURE (K.F.)	47.0 – 51.0
pH (AS IS)	6.0 – 8.0
% SODIUM CHLORIDE	3.0 MAX
COLOR, GARDNER BYK	REPORT

## Reference

- Miranate B

## Performance Attributes

- Extremely low-foaming wetting agent
- Stable to high acid and alkali conditions



## Applications

- Metal cleaning
- Bottle washing
- Steam cleaning
- Wax stripping
- Cleaning of food plants and handling areas







## Chemistry

- C18 ether carboxylates
- Long fatty chain and medium EO chain

PROPERTY	ANALYSIS
APPEARANCE	CLEAR LIQUID
pH (1% AQUEOUS)	2.5 – 4.0
ACID VALUE	75 – 85
% MOISTURE	8.0 MAX
COLOR, GARDNER BYK	7 MAX
% NaCl	1.0 MAX

## Regulatory Listings

- US (TSCA), Canada (DSL), Australia (AICS), Philippines (PICCS), Korea (ECL), New Zealand (NZIoC), China (IECSC), Taiwan (NECI)

## Reference

- Emulsogen COL 050
- AKYPO RO 50 VG



## Performance

- Anionic emulsifier
- Provides cleansing and lubricating action
- Offers hard water stability and high lime soap dispersing power
- Supports corrosion prevention

## Shake Foam Testing

Time	Foam Height (mm)
Immediate	100
@ 1 min	20
@ 5 min	20

<b>HLB</b>	<b>10</b>
K Value	13

# Cola<sup>®</sup>Carb O5C



- Metalworking fluids
  - Emulsions
  - Semi-synthetic
  - Synthetic
- Fire resistant hydraulic fluids (HFA-S)
- Rolling emulsions





## Chemistry

- Trideceth-7 Carboxylic Acid
- CAS Registry #: 56388-96-6
- Physical & Chemical stability
- Polymer-exempt

## Regulatory Listings

- USA (TSCA), EU (REACH), Canada (DSL), Australia (AICS), China (IECSC), Philippines (PICCS), New Zealand (NZIoC), Taiwan (NECI)

PROPERTY	SPECIFICATION
APPEARANCE @ 25°C	CLEAR LIQUID
SOLUBILITY (1% D.I. WATER)	CLOUDY (translucent dispersion)
pH (1% D.I. WATER)	2.5 – 3.5
ACID VALUE	45 – 52
% MOISTURE (K.F.)	8.0 – 10.0
% SODIUM CHLORIDE	1.0 MAX.
COLOR, GARDNER '98	3 MAX.
COLOR, GARDNER BYK	REPORT

## Reference

- AKYPO TD-70



## Performance Attributes

- Anionic stabilizer with optimal dispersing performance
- Help increase the lifetime of water-dilutable metalworking fluids
- Hard water stability & optimal lime soap dispersing power
- Support of the corrosion prevention
- Cleansing action

## Shake Foam Testing

Time	Foam Height (mm)
Immediate	130
@ 1 min	-
@ 5 min	105

<b>HLB</b>	<b>12</b>
K Value	25

## Applications

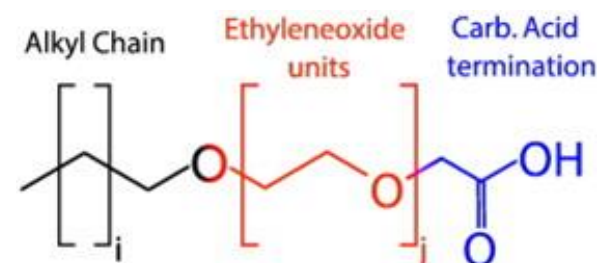
- Industrial
  - Metalworking: Cutting fluids
  - Cleaners
- Personal Care



# Take-Home Message: Ether Carboxylates



- Structure & performance tunable
- Interrupted soaps: combined anionic and non-ionic surfactants
- Versatile: emulsifiers, dispersants, corrosion inhibitors, lubricants
- High electrolyte and hard water tolerance
- Diverse applications: from personal care to lubricants
- Biodegradable



# Colonial Ether Carboxylate Line



- Cola<sup>®</sup>Carb B2C
- Cola<sup>®</sup>Carb BEA
- Cola<sup>®</sup>Carb O5C
- Cola<sup>®</sup>Carb TDC

**More to come...**

*Thank You!*

