ISOCARB $C_{12}-C_{32}$

Branched Acids

Sasol Performance Chemicals

Contents

1. About Us

Sasol Performance Chemicals develops and markets a broad portfolio of organic and inorganic commodity and speciality chemicals. Our business consists of three key business divisions: Organics, Advanced Materials and Wax. Our offices in 18 countries serve customers around the world with a multifaceted portfolio of state-of-the-art chemical products and solutions for a wide range of applications and industries.

Our key products include surfactants, surfactant intermediates, fatty alcohols, linear alkyl benzene (LAB), short-chain linear alpha olefins, mineral oil-based and synthetic paraffin waxes, high-purity and ultra-high-purity alumina as well as high-quality carbon solutions.

Our products are as individual as the industrial applications they serve, with tailor-made solutions creating real business value for customers. Ongoing research activities result in a continuous stream of innovative product concepts that help our customers position themselves successfully in future markets.

Our products are used in countless applications in our daily lives to add value, security and comfort. Typical examples include detergents, cleaning agents, personal care, construction, paints, inks and coatings, metalworking and lubricants, hot-melt adhesives, bitumen modification and catalyst support for automotive catalysts and refineries as well as other specialty applications including oil and gas recovery, agriculture, plastic stabilization, and polymer production. Every day, our researchers explore ways to improve our products and develop innovations that improve the quality of people's lives.

2. General Information

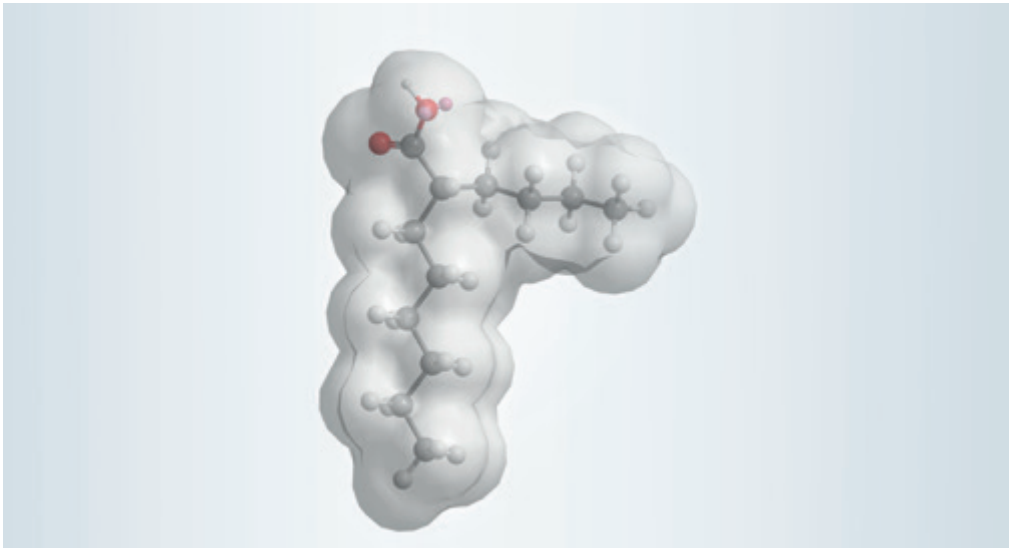
ISOCARB is the registered trademark of Sasol for primary, saturated carboxylic acids with defined branching of the carbon chain.

These products are derived from the oxidation of Guerbet alcohols. **ISOCARB** acids are available with even numbered carbon chain lengths of 12 to 32.

The **ISOCARB** acids maintain many of the beneficial properties of the parent branched alcohols.

- **ISOCARB** acids generally exhibit melting points lower than linear acids with same carbon chain lengths
- Saturation of the carbon chain results in excellent oxidation and colour stability
- **ISOCARB** acids are colourless and almost odourless
- The specific structure of **ISOCARB** acids provides unique polarity and aggregation state properties which yield advantageous solubility and solvent characteristics
- **ISOCARB** acids show anticorrosive properties when neutralised and in aqueous solution
- **ISOCARB** acids generally show excellent stability towards calcium ions when in aqueous solution

Figure 1:
ISOCARB 12 derived from Guerbet alcohol



3. Applications

ISOCARB acids and its derivatives are used as raw materials and intermediates in many specialized applications.

- Esters
- Betaines
- Ethoxylates
- Amides

Metalworking and lubrication

- **ISOCARB** acids can be used as a corrosion inhibitor when formulating lubricating oils and greases which are applied in industrial and automotive applications
- **ISOCARB** acids can be used, neutralized, as ingredient of soluble and synthetic metal-working fluids or in water-based degreasers due to their very good anticorrosion properties

Inks, Paints & Coatings

4. Other Products and Trademarks

Based on the linear alcohols Sasol produces the following specialities:

GALENOL	Self emulsifying blends of linear alcohols
ISOFOL	Defined branched Guerbet alcohols C_{12} to C_{32}
LINPLAST	Plasticizers made from alcohols
NACOL ETHER	Linear di-n-alkyl ethers C_{12} to C_{36}
PARAFOL	High purity normal paraffin cuts C_{12} to C_{22}

Product specific brochures are available with detailed information for **ISOFOL** alcohols, **NACOL ETHER** and **PARAFOL** pure cut paraffins.

Additional information on **GALENOL** and **LINPLAST** can be requested by contacting the local sales office listed on the back of the brochure.

5. ISOCARB

		ISOCARB 12	ISOCARB 16
Chemical name		2-butyl-octanoic acid	2-hexyl-decanoic acid
Appearance at ambient temperature		clear, colourless liquid	clear, colourless liquid

Sales specification

Purity	[wt. %]	min. 96	min. 96
Water content	[wt. %]	max. 0.1	max. 0.1
Colour	[Hazen]	max. 30	max. 40
Acid number	[mg KOH/g]	273–283	212–222

Additional properties

Ester number	[mg KOH/g]	max. 1.0	max. 1.0
Refraction index	[nD]	1.4393 (20 °C)	1.4471 (20 °C)
Molecular weight	[g/mol]	200	256
Melting range	[°C]	-13–-9	16–18
Boiling range	[°C]	270–298	180–185 (10 mbar)
Flash point**	[°C]	157	170

* Pour point
** approx. data

		ISOCARB 24	ISOCARB 32
Chemical name		2-decyl-tetradecanoic acid	2-tetradecyl-octadecanoic acid
Appearance at ambient temperature		colourless, solid	colourless, solid

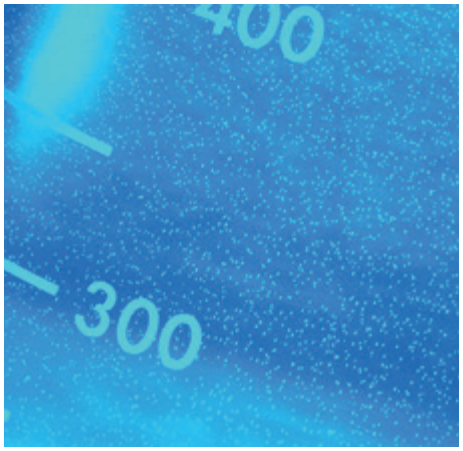
Sales specification

Purity	[wt. %]	min. 95	min. 80
Water content	[wt. %]	max. 0.1	max. 0.1
Colour	[Hazen]	max. 50	max. 400
Acid number	[mg KOH/g]	144–154	105–125

Additional properties

Ester number	[mg KOH/g]	max. 3.0	max. 3.0
Refraction index	[nD]	1.441 (60 °C)	1.437 (80 °C)
Molecular weight	[g/mol]	368	480
Melting range	[°C]	46–50	60–66
Boiling range	[°C]	235–245 (10 mbar)	> 250 (10 mbar)
Flash point**	[°C]	234	250

** approx. data



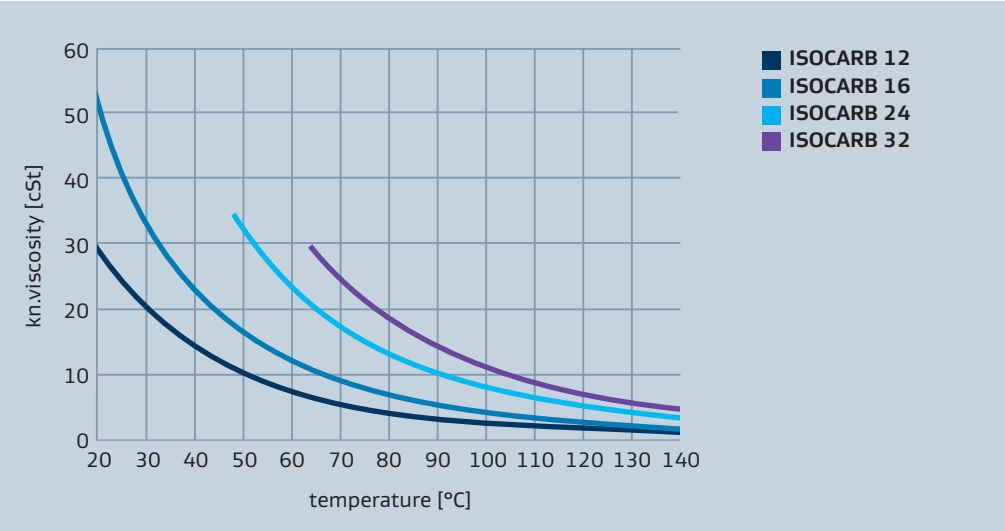
6. Viscosity & Density

Viscosity is a measure of a fluid's ability to resist flow under gravity. The kinematic viscosity of a fluid is defined as the ratio of absolute or dynamic viscosity to its density.

The viscosity of a fluid is highly temperature dependant. For a liquid the kinematic viscosity will decrease with higher temperature, for a gas the kinematic viscosity will increase with higher temperature.

The temperature dependant kinematic viscosity of **ISOCARB** acids is shown in Figure 5.

Figure 3:
ISOCARB acid viscosity vs temperature

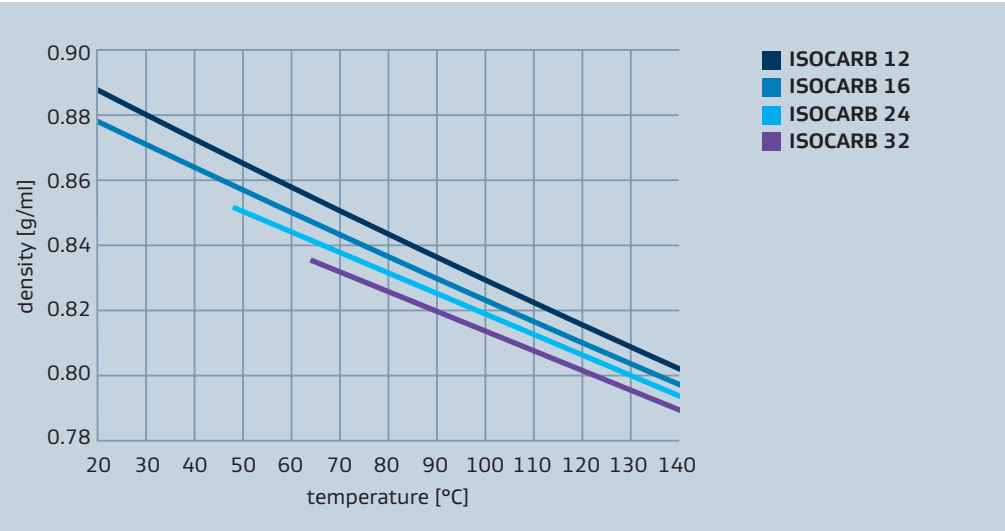


Density is a measure of how much mass is contained in a given unit volume. The formal definition of density is mass per unit volume. Usually the density is expressed in grams per mL.

In general, density can be changed by changing either the pressure or the temperature. Increasing the pressure will always increase the density of a material. Increasing the temperature generally decreases the density, but there are notable exceptions to this generalisation.

The temperature dependant density of **ISOCARB** acids is shown in Figure 4.

Figure 4:
ISOCARB acid density vs temperature



8. Analytical Methods

			Sasol method	with reference to
Acid number			600–31	DIN EN 14 104
Boiling range			600–21	DIN 51 751
Colour			600–40	EN ISO 6271-2
Density			600–23	DIN EN ISO 12 185
Ester number			600–33	—
Flash point	Pensky-Martens	65 °C–165 °C	600–26 b	EN ISO 2719
	Cleveland	> 165 °C	600–26 c	ISO 2592
Melting range			600–22 c	Ph. Eur. 2.2.14
Molecular weight			600–19	—
Purity			1050 F-33	Gas chromatographic method
Refraction index			600–24	DIN 51 423
Viscosity			600–25	ASTM D 7042
Water content			600–37	DIN 51 777

9. Packaging and Delivery

Filled Products

- Delivery of acids with chain lengths of C_{12} to C_{32}
- Special packaging upon request
- Disposable packaging
- Please protect against direct sunlight and environmental influence

In steel drums

- Filling quantity: 160 to 180 kg/drum (depending on product)
- Pallet capacity: 4 drums (screw-cap or screw lid drums) on a CP3 pallet secured by steel strapping
- Closed under a nitrogen blanket

10. Handling and Storage

Storage temperature of **ISOCARB** acids

5 < T < 30 °C
41 < T < 86 °F

- Plant components that come into contact with the product, e.g. pumps, pipes, tank containers etc. should be made of stainless steel where possible; aluminium plant components are unsuitable; petrol resistant hose connections can be used and should be rinsed thoroughly after use.

11. Sasol Performance Chemicals Alcohol Portfolio

LIAL Mixture of linear and mono-branched alcohols from C_9 to C_{17}	Sasol Italy S.p.A. Augusta
ALCHEM Linear alcohol mono-cuts and blends from C_9 to C_{17}	Sasol Italy S.p.A. Augusta
ISALCHEM Mono-branched alcohol mono-cuts and blends from C_9 to C_{17}	Sasol Italy S.p.A. Augusta
NACOL Pure cuts of linear alcohols C_6 to C_{22}	Sasol Germany GmbH Brunsbüttel
NAFOL Blends of linear alcohols C_8 to C_{28}	Sasol Germany GmbH Brunsbüttel
ISOFOL Defined branched Guerbet alcohols C_{12} to C_{32}	Sasol Germany GmbH Brunsbüttel
SAFOL Mixture of linear and branched alcohols C_{12} to C_{13}	Sasol Ltd Secunda
ALFOL Pure cuts and blends of linear Ziegler alcohols C_6 to C_{22}	Sasol Chemicals (USA) LLC Lake Charles

12. Registration

For registration status, please refer to the material safety data sheet or contact us at:

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Our Global Footprint

Source reference

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