



SASOL

ISOCARB $C_{11}-C_{32}$

Branched Acids

Sasol Performance Chemicals



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1. About us

Sasol's Performance Chemicals business unit markets a broad portfolio of organic and inorganic commodity and speciality chemicals. Our business consists four key business divisions: Organics, Inorganics, Wax and PCASG (Phenolics, Carbon, Ammonia and Speciality Gases). About 6300 people (incl. employees from Regional Operating Hubs) in offices in 18 countries serve customers around the world with a multi-faceted 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, ethylene, petrolatum, paraffin waxes, synthetic waxes, cresylic acids, high-quality carbon solutions as well as high-purity and ultra-high-purity alumina. Our speciality gases sub-division supplies its customers with high-quality ammonia, hydrogen and CO₂ as well as liquid nitrogen, liquid argon, krypton and xenon gases.

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 and coatings, leather and metal processing, hot-melt adhesives, bitumen modification and catalyst support for automotive catalysts and other diverse specialty applications including oil and gas recovery, aroma production, plastic stabilisation, 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 branched alcohols. **ISOCARB** acids are available with even and odd-numbered carbon chain lengths of 11 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 11 derived from
OXO alcohol

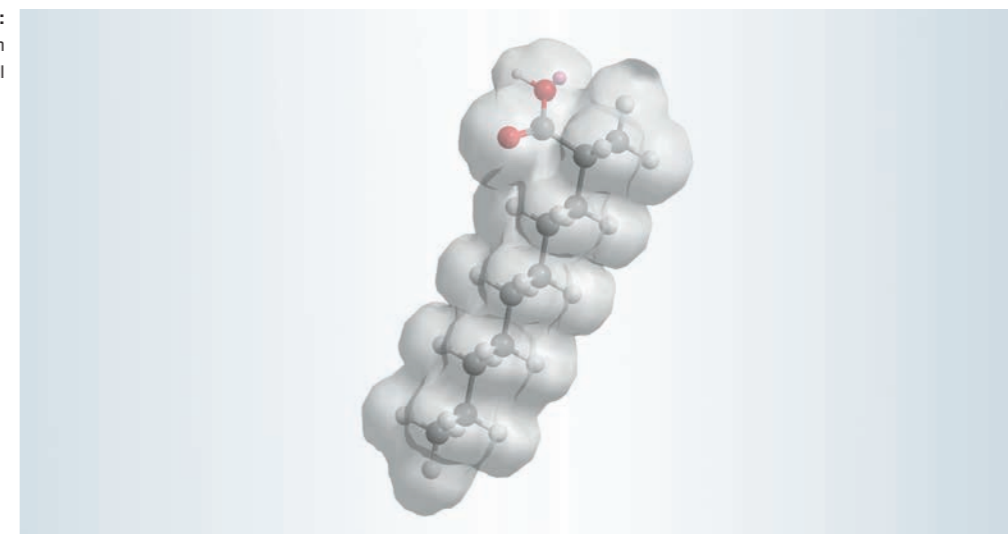
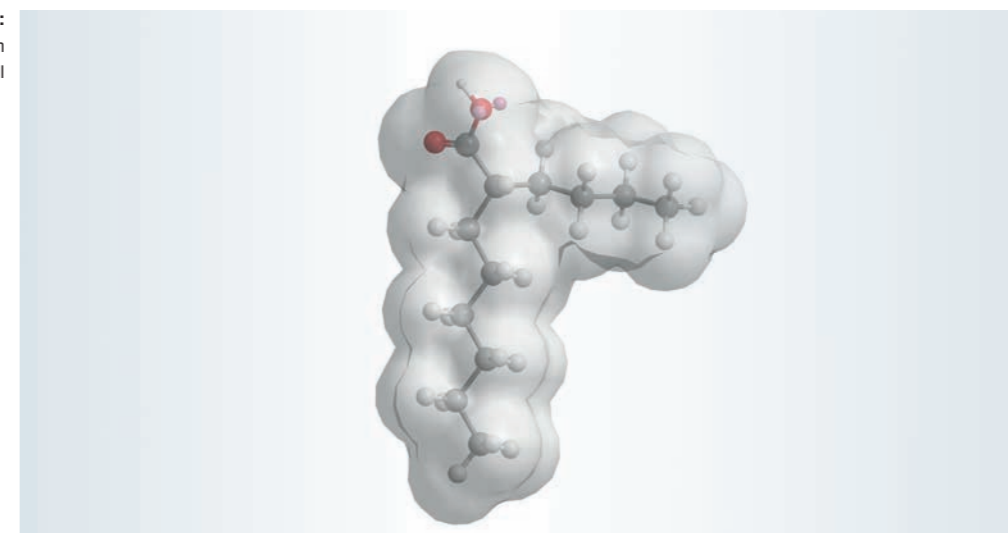


Figure 2:
ISOCARB 12 derived from
Guerbet alcohol



- Sasol **ISOCARB** products are branched organic acids
- Sasol **ISOCARB** products are derived from Oxo alcohols as well as Guerbet alcohols
- Sasol **ISOCARB** products differ in terms of branching and carbon chain length
- Sasol **ISOCARB** products are more than 95% pure
- Sasol **ISOCARB** products have low pour points
- Sasol **ISOCARB** products have low water content

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



4. Other products and trademarks

Sasol markets the linear alcohols worldwide under the following trademarks:

NACOL	Pure cuts of linear alcohols C ₆ to C ₂₂
NAFOL	Blends of linear alcohols C ₈ to C ₂₈

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 **NACOL** alcohols, **NAFOL** alcohols, **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 11	ISOCARB 12	ISOCARB 16
Chemical name	Branched undecanoic acid isomers	2-butyl-octanoic acid	2-hexyl-decanoic acid
Appearance at ambient temperature	clear, colourless liquid	clear, colourless liquid	clear, colourless liquid

Sales specification

Purity	[wt. %]	min. 95	min. 96	min. 96
Water content	[wt. %]	max. 0.1	max. 0.1	max. 0.1
Colour	[Hazen]	max. 50	max. 30	max. 40
Acid number	[mg KOH/g]	295–305	273–283	212–222

Additional properties

Ester number	[mg KOH/g]	n.d.	max. 1.0	max. 1.0
Refraction index	[nD]	n.d.	1.4393 (20 °C)	1.4471 (20 °C)
Molecular weight	[g/mol]	186	200	256
Melting range	[° C]	-80*	-13--9	16–18
Boiling range	[° C]	264 (IBP)	270–298	180–185 (10 mbar)
Flash point**	[° C]	151	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

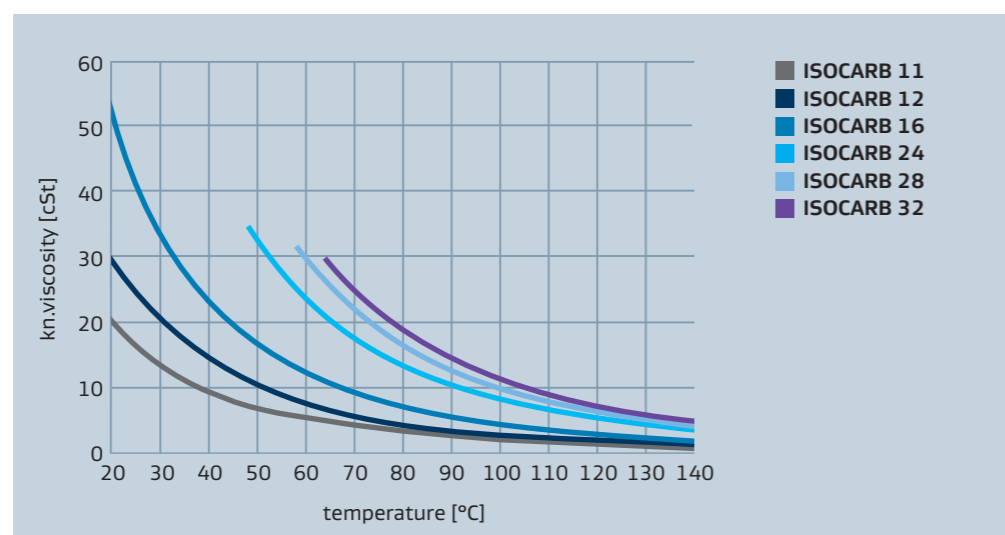
6. Viscosity & Density

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

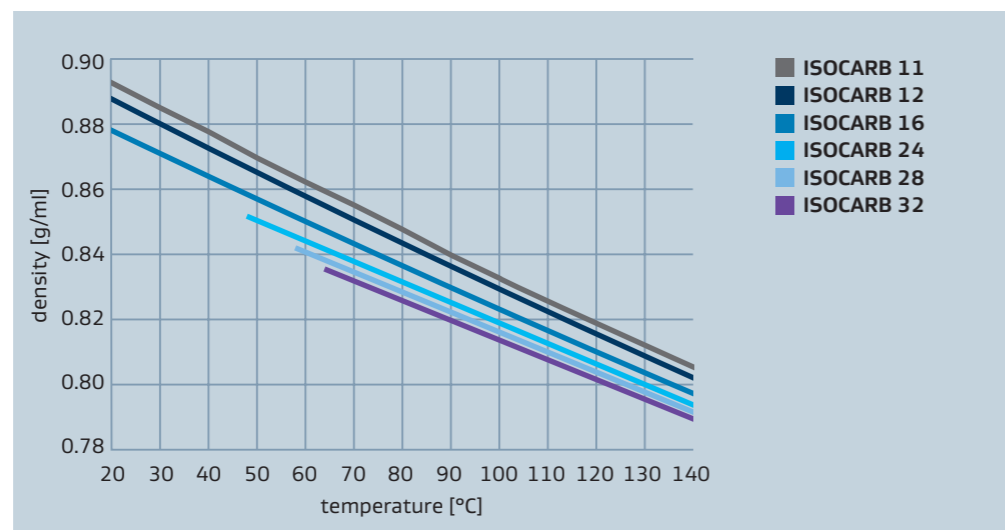


Density is a measure of how much mass is contained in a given unit volume. The formal definition of density is mass per unit volume. Usually the density is expressed in grams per mL.

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 Cleveland > 165° C	600-26 b EN ISO 2719 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

Analytical methods ISOCARB 11

Acid number	ASTM D664
Boiling range	ASTM D86
Colour	EN 1557
Flash point	ASTM D93
Pour point	ASTM D97
Purity	Gas chromatographic method
Water content	EN 12937

9. Packaging and delivery

Filled products

- Delivery of acids with chain lengths of C₁₂ to C₃₂
- 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

ISOCARB 11 is generally supplied in stainless steel drums, details on available packaging can be obtained from sales department

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.

ISOCARB 11 should be stored preferably in stainless steel, HDPE packaging or iron drums inner coated with epoxy-phenolic resin.

11. Registration

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

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Our global footprint

- Sasol Performance Chemicals Headquarters
- Sasol Performance Chemicals Locations eg. Sales offices, laboratories, etc.



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