Material Safety Data Sheet

SECTION 1 Identification of the substance/mixture and of the company/undertaking

Trade name	Coker Gas Oil - MTP Mode
Synonyms	Coker Gas Oil - MTP Mode
Use	Research and development
Company	Sasol Technology Research & Development Andries Brink Building 1 Klasie Havenga Street Sasolburg, 1947 South Africa
Information (Product safety)	Telephone: **+27 16 920 3453** Fax: **+27 11 522 4305**
Emergency telephone	Europe, Israel, Africa, Americas +44 (0)208 762 8322 Middle East, Arabic African countries +961 3 487 287 Asia Pacific +65 633 44 177 China +86 10 5100 3039 South Africa +27 (0)17 610 4444

SECTION 2 Hazards identification

Emergency Overview

Danger	Toxic
State of matter	liquid black
Odour	tar

Potential environmental effects

Potential environmental effects Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

Environmental precautions Prevent product from entering drains. Prevent further leakage or spillage if safe to do so.

Ecological information: See chapter 12

Potential health effects

Acute effects

Skin Toxic in contact with skin

Inhalation Harmful if inhaled.

Ingestion Toxic if swallowed.

Toxicological information: See chapter 11

Chronic effects

Chronic exposure May cause cancer
May cause heritable genetic damage.

SECTION 3 Composition/information on ingredients

Components	CAS-No.	Weight percent
Creosote	8001-58-9	*90.00*
xylenol	1300-71-6	***>= 2.00 - <= 8.00***
phenol; carbolic acid; monohydroxybenzene; phenyl alcohol	108-95-2	***<= 4.00***
cresol	1319-77-3	***<= 4.00***
2,4-xylenol; xylenol	105-67-9	***<= 4.00***
naphthalene	91-20-3	***<= 4.00***
toluene	108-88-3	***<= 3.00***

aniline	62-53-3	***< 2.00***
benzene	71-43-2	***<= 1.00***
Anthracene	120-12-7	***<= 6.00***
Dibenzofuran	132-64-9	***<= 4.00***
9H-Fluorine	86-73-7	***<= 4.00***
Phenanthrene	85-01-8	***<= 4.00***

Exposure limit(s): See chapter 8
Classification and hazard labelling: See chapter 15

SECTION 4 First aid measures

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately. If burns occur, treat as thermal burns.

Skin contact Apply PEG/EtOH solution liberally to affected area. Allow to remain 15 to 30 seconds, then wash with water. Continue cycle of water and PEG/EtOH solution for at least 15 minutes. If symptoms persist, call a physician.

Inhalation Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If symptoms persist, call a physician.

Ingestion If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting. Prevent vomiting if possible. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person.

SECTION 5 Fire-fighting measures

Flammability

Flash point 72 °C closed cup

Fire/explosion Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products	Carbon oxides, Hydrocarbons
Suitable extinguishing media	Water spray Foam Dry powder Carbon dioxide (CO2)
Protection measures and instructions	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Further information	Cool containers / tanks with water spray. In the event of fire and/or explosion do not breathe fumes. Exposure to decomposition products may be a hazard to health.

SECTION 6 Accidental release measures

Personal precautions	Keep people away from and upwind of spill/leak. Remove all sources of ignition. Do not breathe vapours or spray mist.
Environmental precautions	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Soak up with inert absorbent material and dispose of as hazardous waste.
Accidental release measures	Never return spills in original containers for re-use.

Exposure controls/personal protection: See chapter 8

SECTION 7 Handling and storage

Safe handling advice	Ensure adequate ventilation. Do not breathe vapours or spray mist. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Wear personal protective equipment.
Advice on protection against fire and explosion	Keep away from open flames, hot surfaces and sources of ignition.
Storage	Keep containers tightly closed in a cool, well-ventilated place.

SECTION 8 Exposure controls/personal protection

Engineering measures

Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment

Eyes Safety glasses with side-shields

Skin Safety shoes Lightweight protective clothing Use protective skin cream before handling the product.

Inhalation Where airborne concentrations permit (or at low concentrations), air purifying or powered air purifying respirators (full face piece) fitted with organic vapor and gas filtering media (class A1 or class A2) as well as high efficiency particulate arrestors may be used. At high concentrations use self contained breathing apparatus (SCBA) or supplied air (airline and full face piece) operated under positive pressure. Respiratory protection selected must reduce exposure to as far below exposure limits as possible.

Hand protection Gloves suitable for permanent contact:
Material: butyl-rubber
Break through time: 4 h
Material thickness: 0.5 mm
unsuitable gloves
Material: Polyvinylchloride, leather, nitrile rubber/nitrile latex, natural rubber/natural latex

Hygiene measures Wash hands before breaks and immediately after handling the product.

Protective measures Wear suitable protective equipment.

Exposure Guidelines

Components	Exposure limit(s)
CREOSOTE COAL TAR OIL	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
DIMETHYLPHENOL XYLENOL, ALL ISOMERS	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality)
DIMETHYLPHENOL	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality)
ANTHRACENE*	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
PHENANTHRENE	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
FLUORENE	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
DIBENZOFURAN	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL: US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
NAPHTHALENE	US. ACGIH Threshold Limit Values time weighted average 10 ppm US. ACGIH Threshold Limit Values Short term exposure limit 15 ppm US. NIOSH: Pocket Guide to Chemical Hazards Recommended exposure limit (REL): 10 ppm (50 mg/m3) US. NIOSH: Pocket Guide to Chemical Hazards Short term exposure limit 15 ppm (75 mg/m3) US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) Permissible exposure limit 10 ppm (50 mg/m3)

	US. OSHA Table Z-1-A (29 CFR 1910.1000) time weighted average 10 ppm (50 mg/m3)
	US. OSHA Table Z-1-A (29 CFR 1910.1000) Short term exposure limit 15 ppm (75 mg/m3)
	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 10 ppm (50 mg/m3)
	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Short term exposure limit 15 ppm (75 mg/m3)
	EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. time weighted average 10 ppm (50 mg/m3)
	EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. time weighted average 10 ppm (50 mg/m3)
	US. ACGIH Threshold Limit Values
	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL:
	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality)
	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A time weighted average 10 ppm (50 mg/m3)
	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A Short term exposure limit 15 ppm (75 mg/m3)
	Listed Screening levels that have the odor designations represent the levels of constituents in the air at which the odor would be a nuisance. Listed
PHENOL, 2,4-DIMETHYL- (M-XYLENOL)	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL:
	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Annual ESL:
	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Listed
CRESOL (ALL ISOMERS)	US. ACGIH Threshold Limit Values time weighted average 5 ppm
	US. ACGIH Threshold Limit Values Skin designation:
CRESOL, ALL ISOMERS, INHALABLE FRACTION AND VAPOR	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 5 ppm (22 mg/m3)
CRESOL (ALL ISOMERS)	EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. time weighted average 5 ppm (22 mg/m3)
CRESOLS	US. ACGIH Threshold Limit Values
CRESOL, ALL ISOMERS	US. ACGIH Notice of Intended Changes (NIC) to Threshold Limit Values time weighted average (20 mg/m3) Inhalable fraction and vapor.
	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants
	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality)
	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A time weighted

	average 5 ppm (22 mg/m3) Can be absorbed through the skin. Listed
PHENOL	US. ACGIH Threshold Limit Values time weighted average 5 ppm US. ACGIH Threshold Limit Values Skin designation: US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 5 ppm (19 mg/m3) EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. time weighted average 2 ppm (7.8 mg/m3) US. ACGIH Threshold Limit Values US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A time weighted average 5 ppm (19 mg/m3) Can be absorbed through the skin. Listed
TOLUENE; TOLUOL	US. ACGIH Threshold Limit Values time weighted average 20 ppm US. ACGIH Threshold Limit Values Skin designation:
TOLUENE	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 50 ppm (188 mg/m3) US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Short term exposure limit 150 ppm (560 mg/m3) EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. time weighted average 50 ppm (192 mg/m3) EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. Short term exposure limit 100 ppm (384 mg/m3) US. ACGIH Threshold Limit Values US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) Short-Term ESL: EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A time weighted average 100 ppm (375 mg/m3) US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A Short term exposure limit 150 ppm (580 mg/m3) Can be absorbed through the skin. Listed Screening levels that have the odor designations represent the levels of constituents in the air at which the odor would be a nuisance. Listed
ANILINE ANILINE AND HOMOLOGS	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 2 ppm (7.6 mg/m3)

	US. ACGIH Threshold Limit Values US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A time weighted average 2 ppm (8 mg/m3) Listed
BENZENE	US. ACGIH Threshold Limit Values time weighted average 0.5 ppm US. ACGIH Threshold Limit Values Short term exposure limit 2.5 ppm US. ACGIH Threshold Limit Values Skin designation: US. ACGIH Threshold Limit Values US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 1 ppm US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Short term exposure limit 5 ppm EU. OELs, Directive 2004/37/EC on carcinogen and mutagens from Annex III, Part A time weighted average 1 ppm (3.25 mg/m3) Can be absorbed through the skin. Listed

PEL=	Permissible Exposure Limits	TWA=	Time Weighted Average (8 hr.)
TLV=	Threshold Limit Value	STEL=	Short Term Exposure Limit (15 min.)
EL=	Excursion Limit	WEEL=	Workplace Environmental Exposure Level

SECTION 9 Physical and chemical properties

State of matter liquid

Colour black

Odour tar

Boiling point/boiling range 190 - 445 °C

Flash point 72 °C closed cup

Solubility insoluble, immiscible

Viscosity 25 mm2/s at 40 °C

Density 0.977 g/cm3 at 20 °C

SECTION 10 Stability and reactivity

Conditions to avoid Heat, flames and sparks.

Hazardous decomposition products Carbon oxides
Hydrocarbons

Incompatible products Oxidizing agents

SECTION 11 Toxicological information

Acute oral toxicity Creosote:
LD50 rat: ca. 725 mg/kg;

phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:
LD50 rat: 414 mg/kg; (literature value)

cresol:
LD50 mouse: 860 mg/kg; literature value

cresol:
LD50 rat: 1,454 mg/kg; literature value

naphthalene:
LD50 rat: > 2,000 mg/kg; (literature value)

toluene:
LD50 rat: 5,000 mg/kg; literature value

benzene:
LD50 rat: 3,306 mg/kg; (literature value)

Acute inhalation toxicity phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:
LC50 rat: 0.316 mg/l; (literature value)

naphthalene:
LC50 rat: ; 8 h(literature value)

toluene:
LC50 mouse: 5,320 mg/l; literature value

benzene:
LC50 rat: 1,000 mg/l; ; 7 h(literature value)

Acute dermal toxicity phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:

LD50 rat: 670 mg/kg; (literature value)

cresol:
LD50 rabbit: 200 mg/kg; literature value; Causes burns

naphthalene:
LD50 rat: > 2,500 mg/kg;

toluene:
LD50 rat: 12,124 mg/kg; literature value

benzene:
LD50 rabbit: > 9,400 mg/kg; (literature value)

Skin irritation phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:
rabbit: Corrosive; (literature value)

naphthalene:
rabbit: slightly irritating; (literature value)

toluene:
rabbit: moderately irritating; (literature value)

benzene:
rabbit: moderately irritating; ; Irritating to skin.

Eye irritation phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:
rabbit: corrosive; (literature value)

naphthalene:
rabbit: slightly irritating; (literature value)

toluene:
rabbit: Mild eye irritation; (literature value)

benzene:
rabbit: Moderate eye irritation;

Carcinogenicity benzene:
carcinogenic, category 1

SECTION 12 Ecological information

Ecotoxicity effects

Toxicity to fish phenol; carbolic acid; monohydroxybenzene; phenyl alcohol:
LC50 Oncorhynchus mykiss: 10.9 - 12.3 mg/l; 96 h; (literature value)

naphthalene:
LC50 Pimephales promelas: 7.76 mg/l; 24 h; (literature value)

toluene:

	LC50 Pimephales promelas: 34.27 mg/l; 96 h; literature value toluene: LC50 Poecilia reticulata: 59.3 mg/l; 96 h; literature value toluene: LC50 Cyprinodon variegatus: 277 mg/l; 96 h; literature value benzene: LC50 Poecilia reticulata: 63 mg/l; 14 d; (literature value) benzene: Salmo trutta: 12 mg/l; 1 h; (literature value)
Toxicity to daphnia	phenol; carbolic acid; monohydroxybenzene; phenyl alcohol: LC50 Daphnia magna: 10.2 - 15.2 mg/l; 48 h; (literature value) toluene: LC50 Daphnia magna: 313 mg/l; 48 h; literature value naphthalene: LC50 Daphnia magna: 2.16 mg/l; 48 h; (literature value)
Potential environmental effects	Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

SECTION 13 Disposal considerations

Waste Classification	US. EPA Resource Conservation and Recovery Act: (RCRA) D List of Characteristic Hazardous Wastes (40 CFR 261.21-24): D001
Waste from residues / unused products	Dispose of in accordance with local regulations.
Uncleaned empty packaging	Store containers and offer for recycling of material when in accordance with the local regulations.

Handling and storage: See chapter 7
Exposure controls/personal protection: See chapter 8

SECTION 14 Transport information

DOT/49CFR UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (Creosote), 6.1, III
IMDG UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (Creosote), 6.1, III; EmS F-A, S-A
ICAO/IATA UN 2810 Toxic liquid, organic, n.o.s. (Creosote), 6.1, III

SECTION 15 Regulatory information

U.S. Federal Classifications:

OSHA Hazards Toxic by ingestion, Toxic by skin absorption, Possible cancer hazard

SARA 311/312 Chronic Health Hazard

U.S. Regulated Ingredients:

Hazard information reporting

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components	CAS-No.
Benzene	**71-43-2**
Toluene	**108-88-3**
Dibenzofuran	**132-64-9**
Cresol	**1319-77-3**
Phenanthrene	**85-01-8**
Anthracene	**120-12-7**
Phenol	**108-95-2**
Naphthalene	**91-20-3**
Creosote	**8001-58-9**

Spill reporting

US. EPA CERCLA Hazardous Substances (40 CFR 302)

Components	CAS-No.	Reportable Quantity
Naphthalene	**91-20-3**	100 lbs
Xylenol	**1300-71-6**	1,000 lbs
Phenol	**108-95-2**	1,000 lbs
Fluorene	**86-73-7**	5,000 lbs
Anthracene	**120-12-7**	5,000 lbs
Phenanthrene	**85-01-8**	5,000 lbs
Cresol	**1319-77-3**	100 lbs
Dibenzofuran	**132-64-9**	100 lbs
Toluene	**108-88-3**	1,000 lbs
Benzene	**71-43-2**	10 lbs 10 lbs 0.005 mg/L60 mg/kg10 mg/kg2 mg/L5 lbs 10 lbs1 lbs

Health

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

Components	CAS-No.
Benzene	**71-43-2**
Toluene	**108-88-3**

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65): Not listed

Inventories

Registration, Evaluation and Authorisation of Chemicals (REACH)	Components Not listed 3-ETHYL-4-METHYL-PHENOL Phenanthrene Anthracene 9H-Fluorine Dibenzofuran Aniline Creosote Naphtalene 2,4-Xylenol p-Ethylphenol Xylenol Cresol Phenol Toluene Benzene
Switzerland Consolidated Inventory	Components Not listed Naphtalene 3-ETHYL-4-METHYL-PHENOL
US TSCA Inventory	Components Not listed 3-ETHYL-4-METHYL-PHENOL
Canadian Domestic Substances List DSL	Components Not listed 3-ETHYL-4-METHYL-PHENOL
Australian Inv. of Chem. Substances AICS	Components Not listed 3-ETHYL-4-METHYL-PHENOL
New Zealand Inventory of Chemicals	Components Not listed Aniline Dibenzofuran 9H-Fluorine Anthracene Phenanthrene 3-ETHYL-4-METHYL-PHENOL
Jap. Inv. of Exist. & New Chemicals ENCS	Components Not listed 3-ETHYL-4-METHYL-PHENOL
Japan ISHL Listing	Components Not listed 3-ETHYL-4-METHYL-PHENOL
Korean Exist. Chemicals List ECL	Components Not listed

	Dibenzofuran 3-ETHYL-4-METHYL-PHENOL
Philippines Inv. of Chem. Subst. PICCS	Components Not listed Xylenol 3-ETHYL-4-METHYL-PHENOL
Inv. of Exist. Chem. Substances in China	Components Not listed 3-ETHYL-4-METHYL-PHENOL

Other international regulations

WHMIS Classification D2B: Toxic Material Causing Other Toxic Effects
D1B: Toxic Material Causing Immediate and Serious Toxic Effects

SECTION 16 Other information

Hazard Ratings

	Health	Flammability	Reactivity Hazard
NFPA	2	2	0

All reasonable efforts were exercised to compile this MSDS in accordance with ISO 11014 and ANSIZ400.1.1993. The MSDS provides information regarding the health, safety and environmental hazards, at the date of issue, to facilitate the safe receipt, use and handling of the product in the workplace. Since Sasol and its subsidiaries cannot anticipate or control all conditions under which the product may be handled, used and received in the workplace, it remains the obligation of each user, receiver or handler to, prior to usage, review this MSDS in the context within which the product will be received, handled or used in the workplace. The user, handler or receiver must ensure that the necessary mitigating measures are in place as regards health and safety. This does not substitute the need or requirement for any relevant risk assessments to be conducted. It further remains the responsibility of the receiver, handler or user to communicate such information to all relevant parties that may beinvolved in the receipt, use or handling of the product. Although all reasonable efforts were exercised in the compilation of this MSDS, Sasol does not expressly warrant the accuracy or assume any liability for the incompleteness of the information contained herein or any advice given. The product is sold and risk passes in

accordance with the specific terms and conditions of sale.

The MSDS was created by: B. Shamase
The MSDS was approved by: D. Opperman