**MSDS**

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| Name: | Rutin Trihydrate 98% (Titr.) Material Safety Data Sheet |
| Synonym: | Glucopyranoside, quercetin-3 6-O-(6-deoxy-alpha-L-mannopyranosyl)-, beta-D-; 3,3',4',5,7-Pentahydroxyflavone-3-rutinoside; Quercetin rhamnoglucosin |
| CAS: | 153-18-4 |

**Section 1 - Chemical Product** MSDS Name:Rutin Trihydrate 98% (Titr.) Material Safety Data Sheet Synonym:Glucopyranoside, quercetin-3 6-O-(6-deoxy-alpha-L-mannopyranosyl)-, beta-D-; 3,3',4',5,7-Pentahydroxyflavone-3-rutinoside; Quercetin rhamnoglucosin **Section 2 - COMPOSITION, INFORMATION ON INGREDIENTS**

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| CAS# | Chemical Name | content | EINECS# |
| 153-18-4 | Rutin, DAB | 98 | 205-814-1 |

Hazard Symbols: XI Risk Phrases: 36/37/38 **Section 3 - HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW Irritating to eyes, respiratory system and skin.Hygroscopic (absorbs moisture from the air).Light sensitive.The toxicological properties of this material have not been fully investigated. Potential Health Effects Eye: Causes eye irritation. Skin: Causes skin irritation. Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated. Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Chronic: No information found. **Section 4 - FIRST AID MEASURES**Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Notes to Physician: Treat symptomatically and supportively. **Section 5 - FIRE FIGHTING MEASURES**General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing Media: Use agent most appropriate to extinguish fire. Do NOT get water inside containers. Use water spray, dry chemical, carbon dioxide, or appropriate foam. **Section 6 - ACCIDENTAL RELEASE MEASURES**General Information: Use proper personal protective equipment as indicated in Section 8. Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers. **Section 7 - HANDLING and STORAGE**Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Do not allow contact with water. Keep from contact with moist air and steam. Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Store protected from light. **Section 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION**Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Exposure Limits CAS# 153-18-4: Personal Protective Equipment Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure. Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. **Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**Physical State: Powder Color: yellow to green Odor: None reported. pH: Not available. Vapor Pressure: Not available. Viscosity: Not available. Boiling Point: Decomposes Freezing/Melting Point: 195 deg C Autoignition Temperature: Not available. Flash Point: Not available. Explosion Limits, lower: Not available. Explosion Limits, upper: Not available. Decomposition Temperature: > 195 deg C Solubility in water: disulfide and benzene Specific Gravity/Density: Molecular Formula: C27H30O16.3H2O Molecular Weight: 664.58 **Section 10 - STABILITY AND REACTIVITY**Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Conditions to Avoid: Incompatible materials, light, dust generation, moisture, excess heat, strong oxidants. Incompatibilities with Other Materials: Oxidizing agents. Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide. Hazardous Polymerization: Has not been reported. **Section 11 - TOXICOLOGICAL INFORMATION**RTECS#: CAS# 153-18-4: VM2975000 LD50/LC50: Not available. Carcinogenicity: Rutin, DAB - Not listed by ACGIH, IARC, or NTP. Other: See actual entry in RTECS for complete information. **Section 12 - ECOLOGICAL INFORMATION****Section 13 - DISPOSAL CONSIDERATIONS**Dispose of in a manner consistent with federal, state, and local regulations. **Section 14 - TRANSPORT INFORMATION**IATA Not regulated as a hazardous material. IMO Not regulated as a hazardous material. RID/ADR Not regulated as a hazardous material. **Section 15 - REGULATORY INFORMATION**European/International Regulations European Labeling in Accordance with EC Directives Hazard Symbols: XI Risk Phrases: R 36/37/38 Irritating to eyes, respiratory system and skin. Safety Phrases: S 24/25 Avoid contact with skin and eyes. S 28A After contact with skin, wash immediately with plenty of water. S 37 Wear suitable gloves. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). WGK (Water Danger/Protection) CAS# 153-18-4: 1 Canada CAS# 153-18-4 is listed on Canada's NDSL List. CAS# 153-18-4 is not listed on Canada's Ingredient Disclosure List. US FEDERAL TSCA CAS# 153-18-4 is listed on the TSCA inventory. **SECTION 16 - ADDITIONAL INFORMATION**N/A  |

 **Toxicological Information**

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| CHEMICAL IDENTIFICATION**RTECS NUMBER :**VM2975000**CHEMICAL NAME :**Rutin**CAS REGISTRY NUMBER :**153-18-4**BEILSTEIN REFERENCE NO. :**0075455**LAST UPDATED :**199701**DATA ITEMS CITED :**12**MOLECULAR FORMULA :**C27-H30-O16**MOLECULAR WEIGHT :**610.57**WISWESSER LINE NOTATION :**T66 BO EVJ CR CQ DQ& GQ IQ DO- BT6OTJ CQ DQ EQ F1O- BT6OTJ CQ DQ EQ F1HEALTH HAZARD DATAACUTE TOXICITY DATA**TYPE OF TEST :**LD50 - Lethal dose, 50 percent kill**ROUTE OF EXPOSURE :**Intraperitoneal**SPECIES OBSERVED :**Rodent - rat**DOSE/DURATION :**2 gm/kg**TOXIC EFFECTS :**Details of toxic effects not reported other than lethal dose value**TYPE OF TEST :**LD50 - Lethal dose, 50 percent kill**ROUTE OF EXPOSURE :**Intraperitoneal**SPECIES OBSERVED :**Rodent - mouse**DOSE/DURATION :**200 mg/kg**TOXIC EFFECTS :**Details of toxic effects not reported other than lethal dose value**TYPE OF TEST :**LD50 - Lethal dose, 50 percent kill**ROUTE OF EXPOSURE :**Intravenous**SPECIES OBSERVED :**Rodent - mouse**DOSE/DURATION :**950 mg/kg**TOXIC EFFECTS :**Details of toxic effects not reported other than lethal dose value**TYPE OF TEST :**LD50 - Lethal dose, 50 percent kill**ROUTE OF EXPOSURE :**Intraperitoneal**SPECIES OBSERVED :**Rodent - guinea pig**DOSE/DURATION :**2 gm/kg**TOXIC EFFECTS :**Details of toxic effects not reported other than lethal dose value**TYPE OF TEST :**TDLo - Lowest published toxic dose**ROUTE OF EXPOSURE :**Oral**SPECIES OBSERVED :**Rodent - rat**DOSE/DURATION :**973 gm/kg/3Y-C**TOXIC EFFECTS :**Tumorigenic - neoplastic by RTECS criteria Liver - tumors**TYPE OF TEST :**Specific locus testMUTATION DATA**TYPE OF TEST :**Body fluid assay**TEST SYSTEM :**Rodent - rat Bacteria - Salmonella typhimurium**DOSE/DURATION :**2 gm/kg**REFERENCE :**FCTOD7 Food and Chemical Toxicology. (Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523) V.20- 1982- Volume(issue)/page/year: 25,9,1987 \*\*\* NIOSH STANDARDS DEVELOPMENT AND SURVEILLANCE DATA \*\*\* NIOSH OCCUPATIONAL EXPOSURE SURVEY DATA : NOHS - National Occupational Hazard Survey (1974) NOHS Hazard Code - 80506 No. of Facilities: 68 (estimated) No. of Industries: 1 No. of Occupations: 6 No. of Employees: 2770 (estimated) NOES - National Occupational Exposure Survey (1983) NOES Hazard Code - 80506 No. of Facilities: 19 (estimated) No. of Industries: 1 No. of Occupations: 9 No. of Employees: 934 (estimated) No. of Female Employees: 506 (estimated) |