PHD for Physical and Chemical Properties (OV-07 Logical Data Model Subject Area)
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Version 1.0
-Comment ------
This diagram depicts each physical or chemical property of a possibly hazardous substance, a substance in a particular state (such as gas, liquid, or solid), or an isotope.

The ANSI standard for the Material Safety Data Sheet (MSDS) includes this information in section 9- Physical and Chemical Properties.

Product Hazard Data
Physical and Chemical Properties

MISCELLANEOUS-PHYSICAL-OR-CHEMICAL-PROPERTY
Miscellaneous_Physical_Or_Chemical_Property_Identifier

Miscellaneous_Physical_Or_Chemical_Property_Details_Text
Miscellaneous_Physical_Or_Chemical_Property_Name
Miscellaneous_Physical_Or_Chemical_Property_Summary_Text
-Business Description ------
A characteristic that can apply to a MATERIAL and that is not tracked in a more specific representation elsewhere in the relevant data base's data structure. Possible examples include pour point, corrosion rate, and heat value.

PHYSICAL-CONDITION
Physical_Condition_Identifier

Physical_Condition_Details_Text
Physical_Condition_Name
Physical_Condition_Summary_Text
-Business Description ------
A characteristic that can be required of a MATERIAL for the determination of one of its MISCELLANEOUS-PHYSICAL-OR-CHEMICAL-PROPERTY's. For example, a PHYSICAL-CONDITION might be a particular value for the temperature or pressure that must be held constant in order for the MISCELLANEOUS-PHYSICAL-OR-CHEMICAL-PROPERTY's value to be valid. Standard Temperature (70 Degrees Fahrenheit) and Standard Temperature (1 Atmosphere) are PHYSICAL-CONDITIONs that apply to many MATERIALs that have MISCELLANEOUS-PHYSICAL-OR-CHEMICAL-PROPERTY's.

has material identified by

has controlled material identified via

SUBSTANCE-SOLUBILITY-DETERMINATION
Substance_In_Solution_Solute_Identifier (FK)
Substance_In_Solution_Solvent_Identifier (FK)
Substance_Solubility_Determination_Distinguishing_Identifier

Substance_Solubility_Determination_Descriptive_Value_Name
Substance_Solubility_Determination_Gas_Pressure_Quantity
Substance_Solubility_Determination_Gas_Pressure_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Substance_Solubility_Determination_Start_Date
Substance_Solubility_Determination_Organization_Identifier .. Organization_Unique_Identifier (FK)
Substance_Solubility_Determination_Solid_Solubility_Quantity
Substance_Solubility_Determination_Solid_Solute_Solubility_Unit_Of_Measure_Id .. Unit_Of_Measure_Identifier (FK)
Substance_Solubility_Determination_Start_Date
Substance_Solubility_Determination_Stop_Date
Substance_Solubility_Determination_Temperature_Quantity
Substance_Solubility_Determination_Temperature_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
The official establishment of the mass of the solute SUBSTANCE contained in a unit volume of liquid solvent which is in equilibrium with an excess of the solute. That is, each time a molecule of the solute enters the solution, another one leaves the solution. Under these conditions, the solution is said to be saturated. Solubility varies with the temperature of the solute and solvent, which is always the same for both.

The solute can be a solid or a gas. If the solute is a GAS, the solubility is the ratio of the concentration of the GAS in the solution to the concentration of the GAS above the solution. In this case, the solubility also varies with the pressure of the GAS above the solution.

has substance solubility determination shown via

ORGANIZATION
Organization_Unique_Identifier

Organization_Name
Organization_Description_Text
Organization_Category_Code
Organization_Primary_Industry_Category_Code
Organization_Primary_Activity_Code
Organization_Tax_Exempt_Bond_Transfer_Account_Number
Organization_Tax_Identifier
Organization_Classification_Code
Organization_Duration_Type_Code
Organization_DUNS_Number
-Business Description ------
An administrative structure with a mission.

determines

promulgates

performed

MATERIAL-MISCELLANEOUS-PROPERTY
Material_Identifier (FK)
Miscellaneous_Physical_Or_Chemical_Property_Identifier (FK)

Material_Miscellaneous_Property_Descriptive_Value_Text
Material_Miscellaneous_Property_Determining_Organization_Identifier .. Organization_Unique_Identifier (FK)
Material_Miscellaneous_Property_Quantity
Material_Miscellaneous_Property_Start_Date
Material_Miscellaneous_Property_Stop_Date
Material_Miscellaneous_Property_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A scientifically verified and officially established MISCELLANEOUS-PHYSICAL-OR-CHEMICAL-PROPERTY of a MATERIAL.

has physical condition identified via

MISCELLANEOUS-PROPERTY-MATERIAL-CONDITION
Material_Identifier (FK)
Miscellaneous_Physical_Or_Chemical_Property_Identifier (FK)
Physical_Condition_Identifier (FK)
Miscellaneous_Property_Material_Condition_Distinguishing_Identifier

Miscellaneous_Property_Material_Condition_Descriptive_Value_Text
Miscellaneous_Property_Material_Condition_Primary_Material_Indicator
Physical_Condition_Start_Date
Physical_Condition_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A PHYSICAL-CONDITION that applies to a MATERIAL that is involved in the related MATERIAL-MISCELLANEOUS-PROPERTY.

Miscellaneous_Property_Material_Condition_Primary_Material_Indicator

SECONDARY-MATERIAL-MISCELLANEOUS-PROPERTY-MATERIAL-CONDITION
Miscellaneous_Physical_Or_Chemical_Property_Identifier (FK)
Miscellaneous_Property_Material_Condition_Distinguishing_Identifier (FK)
Physical_Condition_Identifier (FK)
Material_Identifier (FK)

Secondary_Material_Identifier .. Material_Identifier (FK)
-Business Description ------
A MISCELLANEOUS-PROPERTY-MATERIAL-CONDITION that applies to a MATERIAL other than the one for which the MATERIAL-MISCELLANEOUS-PROPERTY has been determined.

has physical condition identified by

has miscellaneous property identified by

promulgates

has solubility shown via

SUBSTANCE-IN-SOLUTION
Substance_In_Solution_Solute_Identifier .. Substance_Identifier (FK)
Substance_In_Solution_Solvent_Identifier .. Liquid_Identifier (FK)
-Business Description ------
A SUBSTANCE that is dissolved within another SUBSTANCE in liquid form.

The dissolved SUBSTANCE is called the solute. The LIQUID within which the solute is dissolved is called the solvent.

ODOR-THRESHOLD-EVALUATION-METHOD
Odor_Threshold_Evaluation_Method_Identifier

Odor_Threshold_Evaluation_Method_Details_Text
Odor_Threshold_Evaluation_Method_Name
Odor_Threshold_Evaluation_Method_Summary_Text
-Business Description ------
A technique that is suitable for determining the lowest concentration of a MATERIAL's vapor in air that is necessary for the MATERIAL to be smelled by a typical healthy person who can smell it at some level of concentration. An example is, the Triangle Odor Bag Method.

was used to determine

MATERIAL-ODOR-THRESHOLD-EVALUATION
Material_Identifier (FK)
Material_Odor_Threshold_Evaluation_Distinguishing_Identifier

Material_Odor_Threshold_Evaluation_Date
Material_Odor_Threshold_Evaluation_Quantity
Material_Odor_Threshold_Evaluation_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Material_Odor_Threshold_Evaluation_Organization_Identifier .. Organization_Unique_Identifier (FK)
Odor_Threshold_Evaluation_Method_Identifier (FK)
-Business Description ------
A determination of the lowest concentration of a MATERIAL's vapor in air that necessary for it to be smelled by a typical healthy person who can smell it at some level of concentration.

The odor threshold may be used in evaluating a MATERIAL's warning properties. For example, a MATERIAL with good warning properties has an odor threshold less than 1/10th of the exposure limit. Conversely, MATERIALs with poor warning properties have odor thresholds 3 times or more the exposure limit.

has odor threshold identified by

ODOR
Odor_Name

Odor_Description_Text
-Business Description ------
A way that something can smell.

describes

MATERIAL
Material_Identifier

Material_Appearance_Details_Text
Material_Appearance_Summary_Text
Material_Comments_Text
Material_Density_Specific_Gravity_Overview_Text
Material_Lot_Batch_Indicator
Material_Producer_Supplied_Name
Material_Type_Name
Material_Odor_Name .. Odor_Name (FK)
-Business Description ------
A kind of distinctly identifiable physical matter about which the Department of Defense wants to track information.

Examples include gasoline, friable asbestos, hexavalent chromium, dry ice, the secret ingredient in a popular soft drink, a D battery, a depleted Uranium alloy, Coca Cola in a 12 oz Aluminum can, a 12 oz Aluminum can, a 5 gal can of eggshell white latex paint, a specific batch of jet fuel, and a six-pack of 16-oz bottles of ACME Orange Soda.

has

MATERIAL-TEMPERATURE-THRESHOLD
Material_Identifier (FK)
Material_Temperature_Threshold_Type_Name

Material_Temperature_Threshold_Description_Text
Material_Temperature_Threshold_Temperature
Material_Temperature_Threshold_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
An upper or lower limit to the internal heat of a MATERIAL that causes that MATERIAL to change state (i.e., to a liquid, solid, or gas) or to have changed its susceptibility to certain chemical reactions when held at standard pressure. Examples are Melting Point, Freezing Point, Initial Boiling Point, Final Boiling Point (for a mixture), Autoignition Temperature, and Decomposition Point.

MATERIAL-FLASH-POINT-EVALUATION
Material_Identifier (FK)
Material_Flash_Point_Evaluation_Distinguishing_Identifier

Material_Flash_Point_Evaluation_Date
Material_Flash_Point_Evaluation_Method_Name .. Flash_Point_Evaluation_Method_Name (FK)
Material_Flash_Point_Evaluation_Temperature
Material_Flash_Point_Evaluation_Temperature_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A determination for the related MATERIAL of the minimum temperature at which the MATERIAL gives off a vapor in sufficient concentration to ignite.

If the MATERIAL is a CHEMICAL-COMBINATION, it may have several flash points, the lowest one being for the INGREDIENT with that will ignite first, the second lowest being for the INGREDIENT that will ignite next after all of the first INGREDIENT has burned off or otherwise vaporized out of the CHEMICAL-COMBINATION, and so forth.

has ignition temperature identified by

was used to determine

FLASH-POINT-EVALUATION-METHOD
Flash_Point_Evaluation_Method_Name

Flash_Point_Evaluation_Method_Description_Text
-Business Description ------
A technique that is suitable for determining the temperature at which a material gives off a vapor in sufficient concentration to ignite.

Examples include:
Cleveland Open Cup,
Tagliabue Closed Cup,
Pensky-Martens Closed Cup, and
Setaflash Closed Cup.

is contained as

SUBSTANCE-VAPOR-PRESSURE
Substance_Identifier (FK)
Substance_Vapor_Pressure_Distinguishing_Identifier

Substance_Vapor_Pressure_Specific_Gravity_Quantity
Substance_Vapor_Pressure_Temperature
Substance_Vapor_Pressure_Temperature_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Substance_Vapor_Pressure_Quantity
Substance_Vapor_Pressure_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A measure of the tendency of a solid or liquid SUBSTANCE to become vapor at given temperature.

The measure is the force per unit area exerted by the gaseous form of a SUBSTANCE that is at equilibrium over a liquid or solid version of the SUBSTANCE when it is held in a closed container at a specified temperature.

Material_Type_Name

is solvent for

OBJECT-COMPONENT
Object_Identifier (FK)
Object_Component_Distinguishing_Identifier

Object_Component_Containment_Role_Indicator
Object_Component_Material_Identifier .. Material_Identifier (FK)
Object_Component_Object_Count_Quantity
Object_Component_Temperature_Quantity
Object_Component_Temperature_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Object_Component_Volume_Quantity
Object_Component_Volume_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Object_Component_Weight_Quantity
Object_Component_Weight_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A direct and clearly distinct constituent of the related OBJECTas such an item will be received, not as it might exist after creative maintenance and repair.

E.g., the green paint in a 55 gallon drum of green paint, a specific kind of mother board on a specific kind of lap top computer, a large crow bar in a tank repair tool kit, the 55 gallon drum in a 55 gallon drum of green paint, the 12 oz can of Coke in a 6-pack, or the plastic ring holding a 6-pack of Cokes together.

contains

OBJECT
Object_Identifier .. Material_Identifier (FK)

Object_Separability_Indicator
Object_Volatile_Organic_Compound_As_Applied_Ratio_Quantity
Object_Volatile_Organic_Compound_As_Applied_Ratio_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Object_Volatile_Organic_Compound_As_Applied_Test_Method_Name
Object_Volatile_Organic_Compound_As_Applied_Test_Method_Name

SUBSTANCE
Substance_Identifier .. Material_Identifier (FK)

Substance_State_Complexity_Type_Name
Substance_Clarity_Name
Substance_Color_Name
Substance_Considered_Environmentally_Persistent_Indicator
Substance_Density_Indicator
Substance_Gross_Structural_Type_Name
Substance_Radioactive_Decay_Rate
Substance_Radioactive_Decay_Rate_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Substance_Self_Reactive_Indicator
Substance_Sold_Percent_By_Volume_Quantity
Substance_Sold_Percent_By_Weight_Quantity
Substance_Stability_Indicator
Substance_Stability_Normal_Conditions_Text
Substance_Volatile_Organic_Compound_Volume_Percent_Quantity
Substance_Volatile_Organic_Compound_Volume_Non_Numeric_Quantity_Text
Substance_Volatile_Organic_Compound_Weight_Percent_Quantity
Substance_Volatile_Organic_Compound_Weight_Non_Numeric_Quantity_Text
Substance_Water_N_Octanol_Partition_Coefficient_Quantity
-Business Description ------
A MATERIAL having no inherent limit in extent; therefore without size or shape. E.g., green paint, hydrochloric acid, dry ice, or Coke syrup.

has vapor pressure identified by

has role as constituent shown by

contains

has identifying term shown via

has substance family membership shown by

INGREDIENT
Ingredient_Contained_Substance_Identifier .. Substance_Identifier (FK)
Ingredient_Greater_Substance_Identifier .. Substance_Identifier (FK)

Ingredient_Considered_De_Minimus_Indicator
Ingredient_Considered_DPCRA_Hazardous_Indicator
Ingredient_Considered_Impurity_Indicator
Ingredient_Is_Solvent_Indicator
Ingredient_Percentage_Comment_Text
Ingredient_Non_Numerical_Percent_Calculation_Text
-Business Description ------
A SUBSTANCE that is a direct constituent of another SUBSTANCE.

For example, SUBSTANCE water is an INGREDIENT of SUBSTANCE 95% solution of Isopropyl Alcohol. SUBSTANCE Sodium Chloride is an INGREDIENT of SUBSTANCE saline solution. Elemental Tin is an INGREDIENT of pewter. Copper Oxide is an INGREDIENT of green paint.

Note: A SUBSTANCE that is used in the manufacture of a second SUBSTANCE, but which does not retain its original molecular characteristics in the manufactured SUBSTANCE, is not a direct constituent.

contributes to substance in

INGREDIENT-PERCENTAGE
Ingredient_Contained_Substance_Identifier (FK)
Ingredient_Contained_Substance_Identifier (FK)
Ingredient_Percentage_Measurement_Type_Name
Ingredient_Percentage_Type_Name

Ingredient_Percentage_Quantity
-Business Description ------
A comparative extent that the relevant INGREDIENT contributes to the relevant overall SUBSTANCE.

The percentage may be for one end of a range of allowable percentages. For example, the percentage of Sodium Chloride in saline solution might be at least 3% by weight.

is solute for

Substance_State_Complexity_Type_Name

has single physical state shown via

Substance_Gross_Structural_Type_Name

LIQUID
Liquid_Identifier .. Substance_Physical_State_Identifier (FK)

Liquid_Apparent_Fluidity_Indicator
Liquid_pH_Description_Text
Liquid_pH_Quantity
Liquid_Relative_Evaporation_Rate
Liquid_Viscosity_Quantity
Liquid_Viscosity_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
A SUBSTANCE that is in a form that exhibits readiness to flow, little or no tendency to disperse, and relatively low compressibility.

SUBSTANCE-PHYSICAL-STATE
Substance_Physical_State_Identifier .. Substance_Identifier (FK)

Substance_Physical_State_Nominal_Pressure_Quantity
Substance_Physical_State_Nominal_Pressure_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Substance_Physical_State_Nominal_Temperature
Substance_Physical_State_Nominal_Temperature_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Substance_Physical_State_Original_Substance_Identifier .. Substance_Identifier (FK)
Substance_Physical_State_Specific_Gravity_Quantity
Substance_Physical_State_Type_Name
-Business Description ------
A SUBSTANCE with only one basic observable structure. That is, a SUBSTANCE that is entirely in the form of a gas, liquid, solid, or plasma at standard temperature and pressure or other specified temperature or pressure.

Examples include gaseous carbon dioxide, dry ice (solid carbon dioxide), friable asbestos, and heavy water.

Substance_Physical_State_Type_Name

CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM
Chemical_Abstract_Service_Registry_Item_Number
-Business Description ------
A number from the Chemical Abstract Service (CAS) to designate, at any given time, exactly one CHEMICAL. Over time, the same registry item can have been re assigned to another CHEMICAL. Therefore, over time, the same CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM may apply to more than one CHEMICAL, and the same CHEMICAL can be identified as more than one CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM.

has substance identified via

CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM-ASSIGNMENT
Chemical_Abstract_Service_Registry_Item_Number (FK)
Chemical_Identifier (FK)

Chemical_Abstract_Service_Registry_Item_Assignment_Status_Code
-Business Description ------
A designation of a CHEMICAL as a CHEMICAL-ABSTRACT-SERVICE-REGISTRY-ITEM.

is CAS registry identified via

CHEMICAL
Chemical_Identifier .. Substance_Identifier (FK)

Chemical_Type_Name
-Business Description ------
A macroscopically homogenous SUBSTANCE that exists as such regardless of its physical state.

Examples are gasoline, the secret ingredient in a popular soft drink, and depleted Uranium alloy.

SUBSTANCE-MATCHING-SYNONYM
Substance_Identifier (FK)
Substance_Synonym_Identifier (FK)

Substance_Matching_Synonym_Start_Date
Substance_Matching_Synonym_Stop_Date
Substance_Matching_Synonym_Usage_Type_Name
-Business Description ------
A SUBSTANCE-SYNONYM used to identify a SUBSTANCE.

A SUBSTANCE may have an instance of SUBSTANCE-MATCHING-SYNONYM for many SUBSTANCE-SYNONYMs. For example, methyl ketone,
keytone, hexone, 4-methyl-2-pentanone, isobutyl methyl kiretone, isopropylacetone, MIBK, and MIK are all terms that refer to the same substance.

has relevant substance identified via

SUBSTANCE-SYNONYM
Substance_Synonym_Identifier

Substance_Synonym_Image
Substance_Synonym_Promulgation_Type_Name
Substance_Synonym_Text
Substance_Synonym_Structure_Type_Name
-Business Description ------
A name or other character string that can be used to designate a SUBSTANCE.

Chemical_Type_Name

SOLID
Solid_Identifier .. Substance_Physical_State_Identifier (FK)

Solid_Granulated_Indicator
-Business Description ------
A SUBSTANCE that is in a form that has definite shape and volume at standard temperature and pressure.

GAS
Gas_Identifier .. Substance_Physical_State_Identifier (FK)

Gas_Lower_Concentration_Explosive_Limit_Percent_Quantity
Gas_Upper_Concentration_Explosive_Limit_Percent_Quantity
-Business Description ------
A SUBSTANCE that is in a form that exhibits very low density and viscosity, relatively great expansion and contraction with changes in pressure and temperature, the ability to diffuse readily, and the spontaneous tendency to become distributed uniformly throughout any container.

COMBINATION-SUBSTANCE
Combination_Substance_Identifier .. Substance_Identifier (FK)

Combination_Substance_Type_Name
-Business Description ------
A SUBSTANCE that has direct constituents of other SUBSTANCEs that retain their own chemical properties and makeup as before they were included in the COMBINATION-SUBSTANCE. Physical properties of a COMBINATION-SUBSTANCE, e.g., the melting point, may differ considerably from those of its constituents.

Included are mixtures, alloys, emulsions, suspensions, colloids, nanoparticle matrixes, solutions, and combinations of isomers having the same molecular formula.

Examples are gasoline, air, freeze dried Neapolitan ice cream, a slurry of wood chips in oil, stainless steel, Toluene and water, Xylene (mixed isomers).

ISOTOPE
Isotope_Identifier .. Substance_Identifier (FK)

Chemical_Element_Identifier (FK)
Isotope_Atomic_Mass_Quantity
Isotope_Neutron_Quantity
Isotope_Radioactive_Indicator
-Business Description ------
A SUBSTANCE consisting entirety of atoms of one CHEMICAL-ELEMENT having the same number of neutrons in each atoms' nucleus.

CHEMICAL-COMPOUND
Chemical_Compound_Identifier .. Chemical_Identifier (FK)

Chemical_Compound_Molecular_Formula_Text
Chemical_Compound_Molecular_Weight
-Business Description ------
A CHEMICAL consisting entirety of molecules consisting of more than one bonded atom, each molecule having the same number of atoms of a given atomic number, and each having those atoms bonded and arranged within the molecule in the same way. Distinct isomers, such as dextrose and levulose, are separate CHEMICAL-COMPOUNDs.

E.g., m-Xylene; o-Xylene.

CHEMICAL-ELEMENT
Chemical_Element_Identifier .. Chemical_Identifier (FK)

Chemical_Element_Atomic_Mass_Quantity
-Business Description ------
A CHEMICAL consisting entirety of unbonded atoms, each having the same number of protons in the atom's nucleus.

ionizes into

CHEMICAL-ELEMENT-OXIDATION-STATE
Chemical_Element_Oxidation_State_Identifier .. Substance_Identifier (FK)

Chemical_Element_Identifier (FK)
Chemical_Element_Oxidation_State_Plus_Minus_Indicator
Chemical_Element_Oxidation_State_Count_Quantity
-Business Description ------
A SUBSTANCE consisting entirety of ions of one CHEMICAL-ELEMENT, each having donated or received the same number of electrons during its ionization.

For example, the CHEMICAL-ELEMENT-OXIDATION-STATE Hexavalent Chromium (Chromium VI) has donated six electrons during ionization; therefore, it has an oxidation state of "+6".

REGULATION-SUBSTANCE-SYNONYM
Substance_Synonym_Identifier (FK)

Substance_Synonym_Promulgating_Regulation_Identifier .. Regulation_Identifier (FK)
-Business Description ------
A SUBSTANCE-SYNONYM established by a specific REGULATION.

ORGANIZATION-SUBSTANCE-SYNONYM
Substance_Synonym_Identifier (FK)

Substance_Synonym_Promulgating_Organization_Identifier .. Organization_Unique_Identifier (FK)
-Business Description ------
A SUBSTANCE-SYNONYM established by a specific ORGANIZATION.

Substance_Synonym_Promulgation_Type_Name

has creating radioisotope identified via

contains

has containing compound shown via

GRANULATED-SOLID
Solid_Identifier (FK)

Granulated_Solid_Amorphous_Indicator
Granulated_Solid_Apparent_Density_Quantity
Granulated_Solid_Apparent_Density_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Granulated_Solid_Apparent_Specific_Surface_Area
Granulated_Solid_Apparent_Specific_Surface_Area_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Granulated_Solid_Powder_Indicator
-Business Description ------
A SOLID that consists of small solid particles, each having a size, shape, and micro structure.

Solid_Granulated_Indicator

RADIOISOTOPE-DECAY-ISOTOPE
Isotope_Identifier (FK)
Radioisotope_Identifier (FK)
-Business Description ------
An ISOTOPE that undergoes spontaneous nuclear disintegration.

has created isotope identified via

Isotope_Radioactive_Indicator

CHEMICAL-COMPOUND-ELEMENT
Chemical_Compound_Identifier (FK)
Chemical_Element_Identifier (FK)
-Business Description ------
The inclusion of one or more atoms of the relevant CHEMICAL-ELEMENT within a molecule of the relevant CHEMICAL-COMPOUND.

has contained element shown via

RADIOISOTOPE
Radioisotope_Identifier .. Isotope_Identifier (FK)

Radioisotope_Half_Life_Quantity
Radioisotope_Half_Life_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
-Business Description ------
An ISOTOPE that undergoes spontaneous nuclear disintegration.

promulgates

SUBSTANCE-FAMILY-SUBSTANCE-MEMBERSHIP
Substance_Family_Identifier (FK)
Substance_Identifier (FK)

Substance_Family_Substance_Membership_Include_Exclude_Indicator
Substance_Family_Substance_Membership_Rationale_Text
Substance_Family_Substance_Membership_Start_Date
Substance_Family_Substance_Membership_Stop_Date
-Business Description ------
An inclusion or exclusion of a SUBSTANCE inside a SUBSTANCE-FAMILY.

The exclusion of a SUBSTANCE from a SUBSTANCE-FAMILY is absolute during the time covered by the membership.

That is, if a SUBSTANCE has an instance of a SUBSTANCE-FAMILY-SUBSTANCE-MEMBERSHIP that excludes it from being inside a SUBSTANCE-FAMILY, then the SUBSTANCE is not part of that SUBSTANCE-FAMILY. No SUBSTANCE-FAMILY-SUBSTANCE-MEMBERSHIP instance of a SUBSTANCE-FAMILY-SUBSTANCE-MEMBERSHIP includes the SUBSTANCE in a second SUBSTANCE-FAMILY and 2) the second SUBSTANCE-FAMILY is included as part of the first SUBSTANCE-FAMILY through an instance of SUBSTANCE-FAMILY-SUBSTANCE-FAMILY-MEMBERSHIP.

establishes

is larger family for

is smaller family of

REGULATION
Regulation_Identifier

Regulation_Promulgating_Organization_Identifier .. Organization_Unique_Identifier (FK)
Regulation_Name
Regulation_CFR_Citation_Identifier
Regulation_Start_Date
Regulation_Stop_Date
-Business Description ------
A mandatory requirement established by a government agency (e.g., local, state, national, or international organization) that exerts certain controls on a federal agency or private organization's actions, property, or data, located in a geographic area, during a specific period of time.

For example, Title 49, U.S. Code of Federal Regulations (CFR) Part 173 specifies containers and means of transport of hazardous materials (within the Defense Transportation System). DoD regulation 4500.9-R, "Defense Transportation Regulation," contains the mandatory requirements that apply to DoD's shipments.

SUBSTANCE-FAMILY
Substance_Family_Identifier

Substance_Family_Start_Date
Substance_Family_Stop_Date
Substance_Family_Type_Name
Substance_Family_Name
-Business Description ------
A group of SUBSTANCEs that 1) exhibit similar physical properties and react similarly under similar conditions, or 2) have been established as a group by law, regulation, organizational fiat, or historical usage.

Substance_Family_Type_Name

SUBSTANCE-FAMILY-SUBSTANCE-FAMILY-MEMBERSHIP
Substance_Family_Substance_Family_Membership_Larger_Family_Identifier .. Substance_Family_Identifier (FK)
Substance_Family_Substance_Family_Membership_Smaller_Family_Identifier .. Substance_Family_Identifier (FK)

Substance_Family_Substance_Family_Membership_Include_Exclude_Indicator
Substance_Family_Substance_Family_Membership_Rationale_Text
Substance_Family_Substance_Family_Membership_Start_Date
Substance_Family_Substance_Family_Membership_Stop_Date
-Business Description ------
An inclusion or exclusion of a SUBSTANCE-FAMILY inside another SUBSTANCE-FAMILY.

An exclusion over rides an inclusion. That is, all the SUBSTANCEs that are members of an excluded SUBSTANCE-FAMILY remain excluded even if such a SUBSTANCE is a member of a different included SUBSTANCE-FAMILY.

RADIOISOTOPE-DECAY-EMISSION
Isotope_Identifier
Radioisotope_Decay_Emission_Distinguishing_Identifier
Radioisotope_Identifier (FK)

Radioisotope_Decay_Emission_Energy_Quantity
Radioisotope_Decay_Emission_Energy_Unit_Of_Measure_Identifier .. Unit_Of_Measure_Identifier (FK)
Radioisotope_Decay_Emission_Type_Name
-Business Description ------
A kind of subatomic matter or energy packet that is ejected during the spontaneous nuclear disintegration of the relevant RADIOISOTOPE.

generates

establishes

REGULATION-SUBSTANCE-FAMILY
Substance_Family_Identifier (FK)

Regulation_Substance_Family_Regulation_Identifier
Regulation_Identifier (FK)
-Business Description ------
A SUBSTANCE-FAMILY that is established by a REGULATION.

ORGANIZATION-SUBSTANCE-FAMILY
Substance_Family_Identifier (FK)

Organization_Substance_Family_Organization_Identifier .. Organization_Unique_Identifier (FK)
-Business Description ------
A SUBSTANCE-FAMILY that is made by an ORGANIZATION.

establishes