MATERIAL SAFETY DATA SHEET

VIVANTIS TECHNOLOGIES SDN BHD
REVONGEN CORPORATION CENTER

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SECTION 1: CHEMICAL IDENTIFICATION

Catalogue Number: GF-FD-005; GF-FD-025
Product Name: GF-1 Forensic DNA Extraction Kit with 5 preps and 25 preps
Description: DNA extraction kit for traces of biological materials such as bloodstains, biological fluids, buccal swab, saliva, semen, hair, feather and nail.

Intended Use:
For research use and laboratory use only.

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SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

All concentrations are below the acceptable limits specific to each chemical.

Component(s)	Hazardous Ingredient(s)	CAS No.	Concentration
STL Buffer	Sodium Dodecyl Sulfate	151-21-3	≤1%
BL Buffer	a. Guanidine Hydrochloride b. Tween 20	50-01-1 9005-64-5	≤ 50% ≤ 10%
HB Buffer	No hazardous substance or mixture in the ingredients	-	-
DNA Wash Buffer	No hazardous substance or mixture in the ingredients	-	-
Elution Buffer	No hazardous substance or mixture in the ingredients	-	-
OB Protease	No hazardous substance or mixture in the ingredients	-	-

Acute Effects

The ingredients in this diagnostic kit are irritants to skin, eyes and respiratory system. They are harmful if it comes into contact with the skin and toxic if ingested.

Chronic Effects

Hazardous in case of ingestion.

SECTION 3: HAZARDS IDENTIFICATION

GHS Classification

The extraction kit consists of individual ingredients for different components of kit.

Component(s)	Hazardous Ingredient(s)	CAS No.	Concentration
STL Buffer	Sodium Dodecyl Sulfate	151-21-3	≤1%

Classification (Regulation (EC) No. 1272/2008).
Flammable Solid 2; H228
Acute Toxicity 4; H332
Skin Irritation 2; H315
Serious Eye Damage 1; H318
STOT – Respiratory System 3; H335
Chronic aquatic toxicity 3; H412

Classification (67/548/EEC)
No information available.

Component(s)	Hazardous Ingredient(s)	CAS No.	Concentration
BL Buffer	Guanidine Hydrochloride	50-01-1	≤ 50%

Classification (Regulation (EC) No. 1272/2008)
Acute Toxicity 4; H302
Acute Toxicity 4; H332
Skin Irritation 2; H315
Eye Irritation 2; H319

Classification (67/548/EEC)
Xn; R22
Xi; R41

Component(s)	Hazardous Ingredient(s)
HB Buffer	No hazardous substance or mixture in the ingredients

Classification (Regulation (EC) No. 1272/2008)
Not a hazardous substance or mixture.

Classification (67/548/EEC)
Not a hazardous substance or mixture.

Component(s)	Hazardous Ingredient(s)
DNA Wash Buffer	No hazardous substance or mixture in the ingredients
Classification (Regulation (EC) No. 1272/2008) Not a hazardous substance or mixture.	
Classification (67/548/EEC) Not a hazardous substance or mixture.	

Component(s)	Hazardous Ingredient(s)
Elution Buffer	No hazardous substance or mixture in the ingredients
Classification (Regulation (EC) No. 1272/2008) Not a hazardous substance or mixture.	
Classification (67/548/EEC) Not a hazardous substance or mixture.	

Component(s)	Hazardous Ingredient(s)
OB Protease	No hazardous substance or mixture in the ingredients
Classification (Regulation (EC) No. 1272/2008) Not a hazardous substance or mixture.	
Classification (67/548/EEC) Not a hazardous substance or mixture.	

Classification of the whole kit according to CLASS regulation 2013

Acute toxicity, Category 4, Oral;	H302: Harmful if swallowed
Skin corrosion, Category 1B;	H314: Causes severe skin burns and eye damage
Acute toxicity, Category 2, Dermal;	H317: May cause an allergic skin reaction
Acute toxicity, Category 2, Inhalation;	H332: Harmful if inhaled
Chronic aquatic toxicity, Category 3;	H412: Harmful to aquatic life with long lasting effects

Label elements
Labeling according to regulation (EC) No. 1272/2008
Hazard pictograms

Signal word
Danger

Hazard statements

H302 + H312 + H332	Harmful if swallowed or if inhaled
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H412	Harmful to aquatic life with long lasting effects

Precautionary statements
Prevention:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing dust / fume / gas / mist / vapors / spray
P273	Avoid release to the environment
P280	Wear eye protection / face protection
P280	Wear protective gloves
P284	Wear respiratory protection

Response:

P301 + P330 + P331	If swallowed, rinse mouth. Do not induce vomiting.
P302 + P352	If on skin, wash with plenty of soap and water.
P305 + P351 + P338 + P310	If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor / physician.
P342 + P311	If experiencing respiratory symptoms, call a poison center or doctor / physician.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P370 + P378	In case of fire, use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Other hazards
Not applicable

SECTION 4: FIRST-AID MEASURES

In case of contact with eyes, immediately flush with copious amounts of water for at least 15 minutes. Remove contact lenses, if present and easy to do.
In case of contact with skin, immediately wash with soap and copious amounts of water for several minutes. Take off immediately all contaminated clothing.
In case of ingestion, wash out mouth with water provided the person is conscious. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a physician immediately. Do not attempt to neutralize.
In case of inhalation, move to fresh air. Give artificial respiration if not breathing. Call a physician.

SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media

Suitable:	Water spray, carbon dioxide, dry chemical powder or alcohol-resistant foam
Unsuitable:	High volume water jet

Do not allow run-off from firefighting to enter drains or water courses.
Wear self-contained breathing apparatus and protective clothing and equipment to prevent contact with skin and eyes for firefighting.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions

Wear the protective clothing, rubber gloves and mask. Wear self-contained breathing apparatus, rubber boots and goggles if necessary.
Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, and consult an expert.

Environmental Precautions

Do not let product enter drains. Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

Measures for Cleaning / Collecting

Soak up with inert absorbent material: sand, silica gel, acid binder, universal binder, sawdust.
Collect spilled liquid with liquid-binding material or inert absorbent and place in closed container for disposal.

Dispose of in accordance with federal, state and local environmental regulations.
Wash spill site after material pickup is complete.

SECTION 7: HANDLING AND STORAGE

Handling

Good laboratory techniques should be used when handling. Do not eat, drink, smoke or apply cosmetics in laboratory areas. Do not pipette reagents or samples by mouth. Use reagents according to the product insert.
Work under hood or open-air space. Do not inhale substance / mixture. Avoid generation of vapors / aerosols.

Apply preventive skin protection. Change the contaminated clothing immediately after work. Wash hands and face after working with substance.
Avoid extreme temperatures during transport.

Storage

Store all components as directed in the product insert. Keep tightly closed in a dry and well ventilated place.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Wear appropriate personal protective equipment when working with components or samples, including laboratory coats, disposable gloves and eye protection. Avoid hand and mouth contact. Wash hands as soon as possible after handling components or samples.
Handle in accordance with good industrial hygiene and safety practice.

Control Parameters

Exposure Limits:	Contains no substances with occupational exposure limit values
Engineering measures:	Ensure adequate ventilation, especially in confined areas

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Sodium Dodecyl Sulphate

Environmental Compartment	Value
Fresh Water	0.176 mg/L
Marine Water	0.0176 mg/L
Fresh Water Sediment	6.97 mg/L
Marine Sediment	0.697 mg/L
Soil	1.29 mg/L

Exposure Controls

Respiratory Protection	In case of insufficient ventilation wear respirators and components tested and approved under appropriate government standards.
Hand Protection	Wear suitable protective gloves. Gloves material: compatible chemical-resistant gloves; nitrile rubber gloves.
Eye & Face Protection	Eye wash bottle with pure water. Tightly fitting safety goggles. Wear face-shield and protective suit for abnormal processing problems.
Skin & Body Protection	Wear suitable protective clothing and impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Environmental Exposure Controls

Do not let product enter drains.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information for STL Buffer, BL Buffer, HB Buffer, DNA Wash Buffer, Elution Buffer, OB Protease

Appearance:	Liquid, Colorless	
Odor:	No odor	
pH:	STL Buffer:	pH4-5
	BL Buffer:	pH8-9.5
	HB Buffer:	pH5-6
	DNA Wash Buffer:	pH7-9
	Elution Buffer:	pH8-9
	OB Protease:	pH7.5
Melting Point:	No information available	
Boiling Point:	No information available	
Flash Point:	No information available	
Autoignition Temperature:	No information available	
Decomposition Temperature:	No information available	
Evaporation rate:	No information available	
Flammability:	No information available	
Upper Explosion Limit:	No information available	
Lower Explosion Limit:	No information available	
Vapor Pressure:	No information available	
Relative Density:	No information available	
Specific Gravity:	No information available	
Water Solubility:	All Buffers soluble	
Partition coefficient: n-octanol/water:	No information available	
Explosive Properties:	Not classified as explosive	
Oxidizing Properties:	Not classified as oxidizing	
Other information:	No information available	

SECTION 10: STABILITY AND REACTIVITY

The contents of the kit are stable under normal handling and storage conditions as stated in the product insert until the expiration date indicated on the corresponding label.

Reactivity:	No dangerous reaction known under conditions of normal use
Possibility of hazardous reactions:	Reacts with oxidizing agents; keep away from heat and sources of ignition No decomposition if stored and applied as directed
Conditions to avoid:	Heat, flames and sparks
Incompatible materials:	No dangerous reaction known under conditions of normal use Materials to avoid: strong acids, oxidizing agents, bases
Polymerization:	Hazardous polymerization does not occur

Hazardous decomposition products:
In case of fire hazardous decomposition products may be produced such as: carbon monoxide, carbon dioxide, and unburned hydrocarbons (smoke), nitrogen oxides, ammonia, gaseous hydrogen chloride, carbon oxides, sulphur oxides and sodium oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

Information for Sodium Dodecyl Sulfate (STL Buffer)

Acute oral toxicity:	LD50 Oral (Rat): 1.200 mg/kg
Acute inhalation toxicity:	No information available
Acute dermal toxicity:	LD50 Dermal (Rat, male and female): >2.001 mg/kg
Skin corrosion / irritation:	Causes skin irritation
Serious eye damage / eye irritation:	Causes serious eye damage
Respiratory or skin sensitization:	Not classified based on available information
Germ cell mutagenicity:	Not classified based on available information
Carcinogenicity effects:	Not classified based on available information
Reproductive toxicity:	Not classified based on available information
Aspiration toxicity:	Not classified based on available information
STOT – Single exposure:	May cause respiratory irritation.
STOT – Repeated exposure:	Not classified based on available information

Information for Guanidine Hydrochloride (BL Buffer)

Acute Toxicity

Acute oral toxicity:	LD50 Oral (Rat): 475 mg/kg LD50 Oral (Mouse): 571 mg/kg LD50 Oral (Rat): 1120 mg/kg
Acute inhalation toxicity:	LC50 (Rat, female): 3.2 mg/L; Exposure time: 4hr; Test atmosphere: dust/mist LC50 (Rat, male): 7.7 mg/L; Exposure time: 4hr; Test atmosphere: dust/mist LC50 (Rat, male and female): 5.3 mg/L; Exposure time: 4hr; Test atmosphere: dust/mist
Acute dermal toxicity:	LD50 Dermal (Rabbit): >2001 mg/kg

Skin corrosion / irritation:	Causes skin irritation
Serious eye damage / eye irritation:	Causes serious eye damage
Respiratory or skin sensitization:	Not classified based on available information
Germ cell mutagenicity:	Not classified based on available information
Carcinogenicity effects:	Not classified based on available information
Reproductive toxicity:	Not classified based on available information
Aspiration toxicity:	Not classified based on available information
STOT – Single exposure:	Not classified based on available information
STOT – Repeated exposure:	Not classified based on available information

Information for HB Buffer, DNA Wash Buffer, Elution Buffer

Acute Toxicity:	Not classified based on available information
Skin corrosion / irritation:	Not classified based on available information
Serious eye damage / eye irritation:	Not classified based on available information
Respiratory or skin sensitization:	Not classified based on available information
Germ cell mutagenicity:	Not classified based on available information
Carcinogenicity effects:	Not classified based on available information
Reproductive toxicity:	Not classified based on available information
Aspiration toxicity:	Not classified based on available information
STOT – Single exposure:	Not classified based on available information
STOT – Repeated exposure:	Not classified based on available information

Information for OB Protease

Acute Toxicity:	Not classified based on available information
Skin corrosion / irritation:	Causes skin irritation and / or dermatitis
Serious eye damage / eye irritation:	Causes eye irritation; may cause irreversible eye damage
Respiratory or skin sensitization:	May cause skin allergy or may cause sensitization by inhalation
Germ cell mutagenicity:	Not classified based on available information
Carcinogenicity effects:	Not classified based on available information
Reproductive toxicity:	Not classified based on available information
Aspiration toxicity:	Not classified based on available information
STOT – Single exposure:	May cause respiratory irritation.
STOT – Repeated exposure:	Not classified as specific target organ toxicant, repeated exposure.

Additional toxicological information

The product is not subject to classification according to the calculation method of the General EU Classification Guidelines for preparation as issued in the latest version. When used and handled according to specifications, the product does not have any harmful effects to our experience and the information provided to us.

SECTION 12: ECOLOGICAL INFORMATION

The extraction kit contains **Sodium Dodecyl Sulfate (STL Buffer)** and **Guanidine Hydrochloride (BL Buffer)** known to be hazardous to the environment or not degradable in waste water treatment plants.

Self-assessment: Hazardous for water. Do not allow product or large quantities of it to reach ground water, water course or sewage system.

Toxicity

Sodium Dodecyl Sulfate

Fish: LC50 (Leuciscus idus (Golden orfe)): 29 mg/L

LC50 (Lepomis macrochirus (Bluegill sunfish)): 4.1 mg/L; Exposure time: 96hr

LC50 (Oncorhynchus mykiss (rainbow trout)): 3.6 mg/L; Exposure time: 96hr

NOEC (Pimephales promelas (fathead minnow)): 1.36 mg/L; Exposure time: 42d

Daphnia and other aquatic invertebrates:

EC50 (Daphnia magna (Water flea)): 5.55 mg/L; Exposure time: 48hr

NOEC (Ceriodaphnia dubia (water flea)): 0.88 mg/L; Exposure time: 7d

Microorganisms:

LC50 (activated sludge): 135 mg/L; Exposure time: 3hr

Chronic aquatic toxicity: Harmful to aquatic life with long lasting effects.
Toxicity Data on Soil: Not expected to adsorb on soil.

Guanidine Hydrochloride
Fish: LC50 (Leuciscus idus (Golden orfe): 1759 mg/L; Exposure time: 48hr
Bacteria: EC50 (Pseudomonas putida): 89 mg/L; Exposure time: 18hr

Acute aquatic toxicity:	No known ecotoxicological effects
Chronic aquatic toxicity:	No known ecotoxicological effects
Toxicity data on soil:	Not expected to absorb on soil
Other organisms relevant to the environment:	No data available

Persistence and Degradability
Guanidine Hydrochloride
Biodegradation: <60%
According to the results of tests of biodegradability this product is not readily biodegradable.
Impact on Sewage Treatment: Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

Sodium Dodecyl Sulfate
Biodegradation: 95%; 28d

Bioaccumulative Potential
Guanidine Hydrochloride
Partition coefficient: n-octanol / water: log Pow: ca. -1.7 (20°C)

Sodium Dodecyl Sulfate
Bioaccumulation: Cyprinus carpio (Carp); 3d; 3.9-5.3 (Bioconcentration Factor)
Partition coefficient n-octanol/water: log Pow: -2.03 (20°C)

Mobility in Soil
No data available for the extraction kit, including Sodium Dodecyl Sulfate, Guanidine Hydrochloride and Proteinase K.

Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Other adverse effects
No information available.

SECTION 13: DISPOSAL CONSIDERATIONS

Do not contaminate ponds, waterways or drains with chemical or used container. Used components from this product should be disposed to a licensed waste management company.
Waste material must be dispose of in accordance with federal, state and local environmental regulations.

SECTION 14: TRANSPORT INFORMATION

IATA / ADR / DOT-US / IMDG
Not regulated as dangerous product in the meaning of transport regulations.

UN Number:	Not regulated as dangerous product
UN proper shipping name:	Not regulated as dangerous product
Transport hazard class:	Not regulated as dangerous product
Packing group:	Not regulated as dangerous product
Environmental Hazards:	Not regulated as dangerous product

SECTION 15: REGULATORY INFORMATION

International Inventories

R 22:	Harmful if swallowed.
R 36/37/38:	Irritating to eyes, respiratory system and skin.
R 36/37:	Irritating to eyes and skin.
R 41:	Risk of serious damage to eyes.
R42:	May cause sensitization by inhalation.
R43:	May cause sensitization by skin contact.
S 26:	Rinse eyes immediately with plenty of water.
S 36/37/39:	Wear suitable protective clothing, gloves and eye/face protection.

Korea / Taiwan / China
No information available

US Federal Regulations
SARA 313
Not regulated

US State Regulations

California Proposition 65

Not regulated

Canada Regulatory Information

WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

SECTION 16: OTHER INFORMATION

The information contained in this MSDS relates only to the material(s) designed and does not relate to use(s) in combination with any other material, process(es) and /or chemical reaction(s). Vivantis Technologies Sdn. Bhd. provides this information in good faith, from sources believed to be accurate; however, Vivantis assumes no liability for its accuracy or completeness, and thus shall not be held liable for any damage resulting from handling or from contact with the above product.

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