Republic of Rwanda

RWANDA FDA
Rwanda Food and Drugs Authority

RWANDA FDA GUIDELINES ON PREPARATION OF ALCOHOL BASED HAND SANITIZERS

March 2020

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<th>Revision Date: 24/03/2020</th>
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FOREWORD

Rwanda Food and Drugs Authority is a regulatory body established by the Law N° 003/2018 of 09/02/2018. One of the functions of Rwanda FDA is to regulate matters related to quality, safety and efficacy of regulated products including hand sanitizers.

Considering the provisions of the above said law, especially in its articles 9, the authority has powers to formulate regulations and guidelines for regulating the manufacture, import and export, distribution, sale and use of regulated products.

With reference to the evolving unexpected need of hand sanitizers due to the current declared Novel Coronavirus pandemic, the Authority issues these Guidelines by referring to WHO recommendations on hand rub formulations, a guide to local production and USFDA Temporary Policy for Preparation of Certain Alcohol-Based Hand Sanitizer Products during the Public Health Emergency (COVID-19).

These guidelines provide guidance to manufacturers of hand sanitizers in the current situation whereby there is an urgent need of those products to contain the spread of that pandemic.

Adherence to these guidelines will ensure the quality standards of hand sanitizers on the market during this emergency situation. This will also facilitate efficient and effectiveness of those products as well as their registration.

Dr KARANGWA Charles
Acting Director General
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I.1 INTRODUCTION

Different scientific literatures have shown that Ethyl alcohol, at concentrations of 70%-80% v/v is a potent virucidal agent inactivating all of the lipophilic viruses and many hydrophilic viruses (e.g., adenovirus, enterovirus, rhinovirus, and rotaviruses. The literature contains several accounts of the properties, germicidal effectiveness, and potential uses for stabilized hydrogen peroxide in the health-care setting. Published reports accredit good germicidal activity to hydrogen peroxide and attest to its bactericidal, virucidal, sporicidal, and fungicidal properties.

Isopropyl alcohol, particularly in solutions with 10-40% purified water, is rapidly antimicrobial against bacteria, fungi, and viruses. The most feasible explanation for the antimicrobial action of alcohol is denaturation of proteins. This mechanism is supported by the observation that absolute ethyl alcohol, a dehydrating agent, is less bactericidal than mixtures of alcohol and water because proteins are denatured more quickly in the presence of water.

I.2 BACKGROUND

There is currently an outbreak of respiratory disease caused by a novel coronavirus that was first detected in Wuhan City, Hubei Province, China. This disease was recently detected in Rwanda and WHO declared the Coronavirus outbreak (COVID-19) as pandemic.

The virus has been named “SARSCoV-2” and the disease it causes has been named “Coronavirus Disease 2019” (COVID-19). SARS-CoV-2 has demonstrated the capability to rapidly spread, leading to significant impact on healthcare systems and causing societal disruption. The potential public health threat posed by COVID-19 is high, both globally and in Rwanda. Different higher institutions have communicated the preventive measures including hand washing and use of hand sanitizers, especially among new measures by Ministry of Health to prevent the transmission of COVID-19. Citizens are recommended for effective hand hygiene using clean water and soap as well as alcoholic based sanitizer. It is in
that background that Rwanda FDA has developed guidelines for licensed local compounding premises on preparation of alcoholic based hand sanitizers.

II. PREPARATION OF ETHYL ALCOHOL BASED HAND SANITIZER SOLUTION (80%): ETHANOL 80% (V/V), GLYCEROL 1.45% (V/V), HYDROGEN PEROXIDE 0.125% (V/V)

II.1 Equipment /Material

a. Batch manufacturing record or recording card for stock records
b. Alcoholmeter to ensure the content of alcohol in the formulation
c. Beaker
d. Measuring cylinder
e. Plastic bottles plastic tanks in polypropylene (PE) or high density polyethylene(HDPE)
f. Stainless steel tanks
g. metal, plastic or wooden paddles for mixing
h. Plastic or metal funnel
i. The volume of materials will depend on the volume of solution that you want to prepare II.1 Procedure & Composition

II.2. Procedure and Composition

A. Composition

The composition of the formulation will depend on the volume of the formulation however, the essential recommendation in the range of ingredients and composition of each excipient used as raw materials for preparation ethyl alcohol based hand sanitizer are:

- Ethanol 96%
- Hydrogen Peroxide 3%
- Glycerol 98%
- Distilled water or boiled and cold water

By taking typical example of formulation: Let us take formulation of 10,000ml of 80 % (v/v) ethanol solution as concentration, the following protocol will be used:
<table>
<thead>
<tr>
<th>No</th>
<th>Components</th>
<th>Quantity</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethyl alcohol or Ethanol 96%</td>
<td>8333</td>
<td>ml</td>
<td>Active component</td>
</tr>
<tr>
<td>2</td>
<td>Hydrogen Peroxide 3%</td>
<td>417</td>
<td>ml</td>
<td>Help eliminate contaminating spores in the bulk solution and recipients and is not an active substance for hand antisepsis</td>
</tr>
<tr>
<td>3</td>
<td>Glycerol 98%</td>
<td>145</td>
<td>ml</td>
<td>Glycerol is added as a humectant to increase the acceptability of the product</td>
</tr>
<tr>
<td>4</td>
<td>Sterile distilled or boiled cold water</td>
<td>1105</td>
<td>ml</td>
<td>Sterile distilled water is preferred for making the formulation, boiled and cooled tap water may also be used as long as it is free of visible particles</td>
</tr>
<tr>
<td>5</td>
<td>Total quantity</td>
<td>10000</td>
<td>ml</td>
<td></td>
</tr>
</tbody>
</table>

B. Procedure

i. Measure each volume of ingredients,

ii. 8333 ml of Ethyl alcohol or Ethanol 96% to be used is poured into the large bottle or tank up to the graduated mark

iii. 417 ml of Hydrogen peroxide 3% is added using the measuring cylinder.

iv. 145 ml of Glycerol 98% is added using a measuring cylinder.

Note: As glycerol is very viscous and sticks to the wall of the measuring cylinder, it should be rinsed with some sterile distilled or cooled boiled water and then emptied into the bottle/tank.

v. The bottle/tank is then topped up to the 10-litre mark with sterile distilled or cold boiled water meaning 1105 ml of sterile distilled water is added

vi. Put the screw cap is placed on the tank/bottle as soon as possible after preparation, in order to prevent evaporation

vii. Mix the solution by shaking gently where appropriate or by using a paddle.

viii. The solution obtained is then 10000 ml of handrub/hand sanitizer formulation.
After formulation, packaging of the formulation using appropriate container closure system either must be done 100ml, 200ml, 250ml, 500ml, 1000ml, and 5000ml depending on your capacity.

Place the bottles in quarantine for 72 hours before use. This allows time for any spores present in the alcohol or the new/re-used bottles to be destroyed.

III. Preparation of Isopropyl alcohol based hand sanitizer solution (75%): Isopropyl 75% (v/v), Glycerol 1.45% (v/v), Hydrogen peroxide 0.125% (v/v)

III.1. Procedure & Composition

A. Composition

The composition of the formulation will depend on the volume of the formulation however, the essential recommendation in the range of ingredients and composition of each excipient used as raw materials for preparation ethyl alcohol based hand sanitizer are:

- Isopropyl alcohol 99.8%
- Hydrogen Peroxyde 3%
- Glycerol 98%
- Distilled water or boiled and cold water

By taking typical example of formulation: Let us take formulation of 10,000ml of 75% (v/v) of Isopropyl alcohol solution as concentration, the following protocol will be used:

<table>
<thead>
<tr>
<th>No</th>
<th>Components</th>
<th>Quantity</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Isopropyl alcohol 99.8%</td>
<td>7515</td>
<td>ml</td>
<td>Active component</td>
</tr>
<tr>
<td>2</td>
<td>Hydrogen Peroxyde 3%</td>
<td>417</td>
<td>ml</td>
<td>Help eliminate contaminating spores in the bulk solutions and recipients and is not an active substance for hand antisepsis.</td>
</tr>
<tr>
<td>3</td>
<td>Glycerol 98%</td>
<td>145</td>
<td>ml</td>
<td>Glycerol is added as a humectant to increase the acceptability of the product.</td>
</tr>
<tr>
<td>4</td>
<td>Sterile distilled or boiled cold water</td>
<td>1923</td>
<td>ml</td>
<td>Sterile distilled water is preferred for making the formulations, boiled and cooled tap water may also be used as long as it is free of visible particles.</td>
</tr>
<tr>
<td></td>
<td>Total Quantity Needed</td>
<td>10000</td>
<td>ml</td>
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B. Procedure

i. Measure each volume of ingredients,
ii. 7515 ml of Isopropyl alcohol 99.8% be used is poured into the large bottle or tank up to the graduated mark
iii. 417ml of Hydrogen peroxide 3% is added using the measuring cylinder.
iv. 145ml of Glycerol 98% is added using a measuring cylinder.

Note: As glycerol is very viscous and sticks to the wall of the measuring cylinder, it should be rinsed with some sterile distilled or cold boiled water and then emptied into the bottle/tank.

v. The bottle/tank is then topped up to the 10-litre mark with sterile distilled or cold boiled water meaning 1105 ml of sterile distilled water is added
vi. Put the screw cap is placed on the tank/bottle as soon as possible after preparation, in order to prevent evaporation
vii. Mix the solution by shaking gently where appropriate or by using a paddle
viii. The solution obtained is then 10000ml of handrub/hand sanitizer formulation.
ix. After formulation, packaging of the formulation using appropriate container closure system either must be done 100ml, 200ml, 250ml, 500ml, 1000ml, and 5000 ml, depending on your capacity.

x. Place the bottles in quarantine for 72 hours before use. This allows time for any spores present in the alcohol or the new/re-used bottles to be destroyed.

IV. QUALITY CONTROL AND QUALITY ASSURANCE OF THE FORMULATION

a. Verify the alcohol concentration with the alcoholometer or any other laboratory technic when available and make the necessary adjustments in volume in the preparation formulation to obtain the final recommended concentration.
b. Post-production analysis is mandatory if either ethanol or an isopropyl alcohol solution is used.
c. Use the alcoholometer to control the alcohol concentration of the final use solution.
d. The accepted limits should be fixed to ± 5% of the target concentration (75%–85% for ethanol).

V. INDICATIONS

❖ As recommended by WHO, this formulated handrub formulations can be used both for hygienic hand antisepsis and for presurgical hand preparation.

❖ At present, alcohol-based handrubs are the only known means for rapidly and effectively inactivating a wide array of potentially harmful microorganisms on hands.

VI. LABELLING REQUIREMENTS

Reference made to the circular with Ref No: ODG/CRC/003/RwandaFDA/2020, Rwanda FDA has recommended the following information on label of hand sanitizer:

a. Proprietary name
b. Brand name (Handrub formulation or Hand sanitizer)
c. Indication of the product
d. Batch number assigned by the manufacturer
e. Manufacturing date
f. Expiry date
g. Name and address of Manufacturing facility/Compounding Pharmacy
h. Directions for use, “For external use only”
i. Warnings or precautions that may be necessary:
   • Avoid contact with eyes
   • Keep out of the reach of children
j. A list and concentration of active ingredients: alcohol at 70% v/v, and other ingredients such as Hydrogen peroxide, glycerol or glycerin
k. Pharmaceutical form: gel or solution
l. Storage condition

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VII. PACKAGING MATERIALS

Bottle of polypropylene (PE) or high density polyethylene (HDPE) of 100, 120ml, 250ml, 500ml, 1litre, 5liters, depending on capacity should be used as container of prepared solution.

VIII. STORAGE AND SAFETY PRECAUTIONS

1. Production and storage facilities should ideally be air conditioned or kept in cool rooms.
2. No naked flames or smoking should be permitted in these areas.
3. Since undiluted ethanol is highly flammable and may ignite at temperatures as low as 10°C, production facilities should directly dilute it to the above-mentioned concentration. The flashpoints of ethanol 80% (v/v) and of isopropyl alcohol 75% (v/v) are 17.5°C and 19°C, respectively.
4. Since ethanol and Isopropyl alcohol are flammable they should be kept in separate room from other health commodities.
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<td><strong>ALEX GISAGA</strong></td>
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<td><strong>Dr KARANGWA</strong></td>
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<tr>
<td></td>
<td><strong>Charles</strong></td>
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