



PREPARATION AND USE OF CORONAVIRUS DISINFECTANTS

The following information is based on the scientific literature and leading authorities such as the World Health Organization (WHO) and the China and US Center for Disease Control (CDC).

With anticipated shortages of sanitizing agents we provide instructions for the preparation and use of disinfectant solutions that are effective at killing the Coronavirus. Suggested use of the disinfectants are described below. Links are also provided for the source literature.

- Purchase and fill both travel and larger sized spray bottles with disinfectant solution
- Carry the travel size with you at all times outside the home
- Upon contact with a foreign surface spray and rub hands together to help disinfect
- If using a credit card, phone, writing device, spray before putting away
- Spray door handles on car and home before entering/exiting
- Do not bring any items inside your home that have contacted outside surfaces

Grocery or Shopping

Stores may not have sufficient sanitary wipes. Additionally, wiping down a grocery cart is not practical. The method described below takes less than 30 seconds and helps reduce viral load that could be transferred to you or your groceries.

- Obtain shopping cart, return to vehicle, and use the larger spray bottle of alcohol solution to spray down insides cart focusing on handles and children seating areas/back rests
- While shopping spray your hands frequently using the travel size disinfectant bottle after contacting items and placing in your cart

Disinfecting Groceries

Do not bring grocery bags into home before disinfecting. Instead treat as described below.

- Identify a sink and/or treatment area away from kitchen and other visited areas such as a garage or wash room to process groceries
- Remove groceries from bag and;
 - 1) wipe down each item with commercial Clorox wipes or
 - 2) spray with the 70% isopropanol solution and wipe dry or
 - 3) for items difficult to wipe like frozen bags vegetables, treat by filling sink or bucket with a bleach solution and submerge briefly before transferring to your pantry, refrigerator, freezer, or kitchen area.

NOTE: Redundant non-refrigerated supplies not needed for more than one week can be stored in an unprocessed state in low traffic areas like a garage, attic, cellar, or wash room as the virus will die naturally at ambient temperatures.



Packages and Mail

- Covid-19 surface survival time can last days. Per the US or China CDC this mode of transfer is currently not alerted but in our modern era of overnight shipping it is critical all packages get wiped down as described for groceries before bringing into the home.

Other

- Leave phone and purse at home if not needed. Take loose credit cards, or driver license so you can easily wipe down and to avoid passing the virus from external surfaces to items you handle often
- Leave shoes and other garments outside or in wash room. These porous surfaces will 'self' disinfect in a short period of time.
- For common entry areas set up a towel and wet in bleach to step on and disinfect shoes when returning from stores outside areas

NOTE- Freezer and cold storage will preserve virus so it is important to disinfect before putting items into any type of cold storage

PREPARATION OF DISINFECTANT SOLUTIONS

Commercial rubbing alcohol, e.g, isopropyl alcohol, isopropanol, sold as a 70% solution in water, is the recommended concentration to use as a disinfectant and can be used 'as is'. For 99.9% or 90% isopropyl alcohol we provide dilution recipes below to achieve the desired target concentration of 70%. If isopropanol becomes unavailable ethanol (grain alcohol) may be substituted. A bleach solution preparation is also described which is practical for 'dipping' items to disinfect. The WHO recommended hand sanitizing recipe is also provided.

Isopropanol or Ethanol Solutions

If only 99.9% (pure) isopropanol or ethanol is available you can prepare a 70% alcohol solution as described below. If using ethanol / grain alcohol (200 proof) a 70% solution would be 140 proof so 'no' your Tito's vodka (40% alcohol. 80 proof) or Wild Turkey 101 (50% alcohol) won't be effective. Besides even the Coronavirus does not deserve our sacred preserves.

Directions to Prepare a 70% Alcohol Solution Using 99.9% Isopropyl Alcohol:

Measure 350 mL alcohol in a measuring cup and pour into a container. Measure 150 mL of water and add to the measured isopropanol and mix. Adjust the volume by adding more water as necessary to achieve a final volume of 500 mL.

NOTE: Alcohol and water are 'non ideal' solutions. If you mix 1 part water with 1 part alcohol you don't end up with 2 parts total! Thus in our procedure above you will end up with about 480 mL after combining the 350 mL alcohol and 150 mL water thus the need to make the final adjustment to achieve the final 500 mL target volume.



Diluting 90-91% Isopropyl Alcohol to achieve a 70% solution:

To achieve a 70% solution using 90-91% input isopropanol add about 400 mL of water to 2 liters of alcohol and you will end up with something 2.5 liters of 70% isopropanol.

Bleach Solutions

Commercial Bleach and Water

Directions to Prepare a Bleach Solution:

Mix $\frac{1}{3}$ cup bleach per 1 gallon of water or 4 teaspoons bleach per 1 quart of water or 1 part to 25 parts water is effective in killing virus albite longer times required up to 10 minutes. Bleach solutions in water compliment alcohol solutions and can be used to dip produce and other items for disinfecting prior to bringing into home.

The WHO Hand Sanitizing Solution

Isopropyl Alcohol, Hydrogen Peroxide, Water, and Glycerol

This solution can also be used in spray bottles.

Directions to Prepare the WHO Hand Disinfectant Solution:

The WHO procedure utilizes either pure ethanol (grain alcohol) or pure isopropyl alcohol. Procedures below have been adjusted to allow for use of more common 70% or 90% isopropyl alcohol if 99.9% not available.

Use of 100% Ethanol:

- 1) Ethanol 8.3 parts by volume is poured into a large bottle or tank
- 2) Hydrogen peroxide 0.42 parts is added using the measuring cylinder
- 3) Glycerol 0.15 parts is added using a measuring cylinder. As glycerol is very viscous and sticks to the wall of the measuring cylinder, it should be rinsed with some water and then emptied into the bottle/tank
- 4) The bottle/tank is then topped up to the 10 part mark with sterile distilled or cold boiled water
- 5) The solution is mixed and used in lotion or spray bottles

Use of 100% Isopropyl Alcohol:

- 1) Isopropyl alcohol 7.5 parts by volume is poured into a large bottle or tank
- 2) Hydrogen peroxide 0.42 parts is added using the measuring cylinder
- 3) Glycerol 0.15 parts is added using a measuring cylinder. As glycerol is very viscous and sticks to the wall of the measuring cylinder, it should be rinsed with some water and then emptied into the bottle/tank
- 4) The bottle/tank is then topped up to the 10 part mark with sterile distilled or cold boiled water
- 5) The solution is mixed and used in lotion or spray bottles



Use of 70% Isopropyl Alcohol:

- 1) For 70% Isopropyl alcohol use 10.7 parts by volume.
- 2) Add Hydrogen peroxide 0.42 parts
- 3) Add Glycerol 0.15 parts
- 4) The solution is mixed and used in lotion or spray bottles

Use of 90% Isopropyl Alcohol:

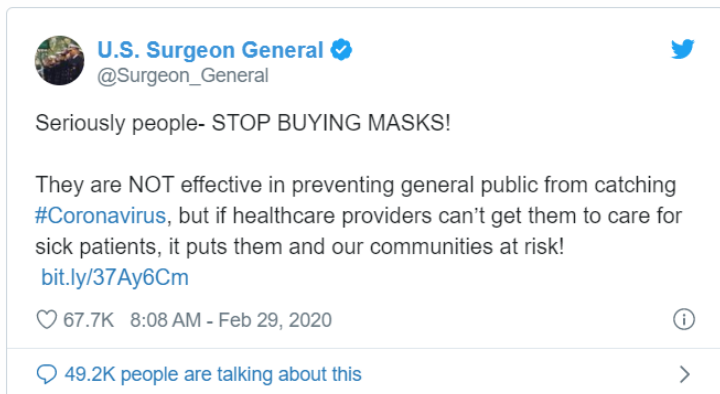
- 1) For 90% Isopropyl alcohol use 8.4 parts
- 2) Add Hydrogen peroxide 0.42 parts
- 3) Add Glycerol 0.15 parts
- 4) The bottle/tank is then topped up to the 10 part mark with sterile distilled or cold boiled water
- 5) The solution is mixed and used in lotion or spray bottles

Other Available Household Agents

A link is provided to an EPA listing of common household agents that are proven effective against the coronavirus. While not included common house hold cleaners such as Windex, glass cleaners, and ammonia based cleaners will also be effective.

Masks

A Tweet from our surgeon general states masks are not effective in preventing transmission of the Coronavirus. For the record this is insulting to basic intelligence and scientific principles. OF COURSE masks prevent transmission. The truth is that America does not have enough masks thus instead of telling the truth our own leaders try to convince us that masks are magically only effective for health care workers. [Read the China CDC website yourself referenced below where ‘policy’ requires all citizens not to leave your home without donning of a mask.](#)





USEFUL REFERENCES AND LINKS

WHO Hand sanitizer:

https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf

EPA Tested House hold / commercial antiviral products:

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents:

<https://doi.org/10.1016/j.jhin.2020.01.022>

USA CDC “Coronavirus Disease 2019 (COVID-19):

https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcases-in-us.html

China CDC “Covid-19 Prevention and Control:

[http://www.chinacdc.cn/en/COVID19/:](http://www.chinacdc.cn/en/COVID19/)

Effectiveness of common household cleaning agents in reducing the viability of human Influenza A/H1N1

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2813869/>

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