SENSITIVITY CHECK

Purpose: To test a person's ability to detect very low concentrations of isoamyl acetate (IAA).

Materials

- Two clean medicine droppers or syringes with cc or ml markings.
- Isoamyl acetate (IAA, also known as isopentyl acetate).
- Odor-free water, distilled or spring water.
- Three clean 1-liter glass jars with metal lids (e.g., Mason or Ball jars) that are volumetrically graduated. (Note: non-glass jars may absorb IAA.)

Preparation

The mixtures used in the IAA odor detection test must be prepared in an area separate from the area where the test is performed. This separation will prevent olfactory fatigue from rendering a subject unable to detect the odor of IAA. Fatigue can occur at very low background levels. Only the 1.0 ppm test solution and the blank jars should be taken to the sensitivity check area.

1. Prepare Stock Solution. To prepare the IAA stock solution, squirt 1 cc of full strength IAA into a 1-liter jar containing 800 cc of odor-free water. Secure the jar lid, and shake the contents of the stock solution for half a minute. This mixture is good as a stock solution for one week.
2. Prepare Test Solution. Put 500 cc of odor-free water in a second jar. Remove the lid from the jar of IAA stock solution, and with clean dropper or syringe extract .5 cc of IAA stock solution and transfer it into this second jar. Immediately screw on the jar lid and shake the contents for half a minute. Allow the mixture to sit undisturbed for 2 or 3 minutes (to allow the IAA concentration to reach equilibrium). This 1.0 ppm test solution is good for a full day's use.
3. Prepare blank jars (controls). Pour 500 cc water into a second and third 1-liter jar. The second and third jars will serve as controls. Label each jar 1, 2 and 3 to identify the jars. (If the labels are put on the lid, the test administrator can periodically dry the lids off and switch them to discourage any assumption that any one jar always has the IAA.)

Caution must be taken to assure that the blanks do not become contaminated with IAA. To achieve proper results, jars should be tightly covered and shaken well before each use.

Test Procedure

- Without indicating which jar contains the IAA, ask the subject to shake each bottle, then remove the lid and identify the jar having the odor of IAA.
- The following directions can be read from an index card to standardize the test.

  > The purpose of this test is to determine if you can smell odors at a low concentration. The bottles in front of you contain water. One of these bottles also contains a small amount of banana oil or IAA. Be sure that the covers are tight; then shake each bottle for 2 seconds, unscrew the lid of each bottle one at a time, and sniff the mouth of the bottle. Identify to the instructor in which bottle you can detect an odor.

- If the test subject smells banana oil or IAA in the correct jar, tell the test subject to beware that level of odor inside the respirator when the fit test is being conducted, and proceed with the QLFT (See attached SOP: "Qualitative Fit Test: Administering the Isoamyl Acetate Test").
- If no odor in the IAA jar is detected, prepare a stronger mixture by extracting 1 cc from the stock mixture and squirting it into a jar containing 500 cc of water. Again prepare a blank. If the subject detects isoamyl acetate in the correct jar, tell the test subject to beware that level of odor inside the respirator when the fit test is being conducted, and repeat this QLFT.
- Any test subjects who cannot detect IAA should be re-examined to ensure that they can detect the odor of contaminants with which they will be working. If no odor is detected in this test, proceed with the irritant smoke test (See attached SOP: "Stannic Oxychloride Irritant Smoke Respirator Fit Test").