

Unless you have worked with vendors to eliminate mercury from your lab, a number of your reagents may contain mercury. Mercury—a toxin associated with nervous system disorders—is especially toxic to newborn babies, children and pregnant women. It can also have an adverse affect on wildlife.

The U.S. Environmental Protection Agency (EPA) and the American Hospital Association (AHA) have committed to a voluntary agreement to virtually eliminate mercury waste in hospitals and health systems. Hospitals have many reasons to reduce their use of mercury. New federal air and water regulations greatly reduce the amount of mercury allowed to be discharged from a municipal wastewater system or an incinerator. Mercury can now be measured at lower levels, making it easier for regulatory agencies to identify facilities that are not in compliance. Reducing mercury in your lab can reduce the level of mercury in the environment and help your facility avoid the need to increase its investment in pollution controls and waste disposal.

Mercury is present in many lab reagents as a preservative and as a common contaminant. Thimerosal is a widely-used preservative with a high level of mercury.\* Contaminant mercury comes from mineral mining or from manufacturing processes that use a mercury cell to produce the sodium in sodium products. As a contaminant, mercury's presence may vary from lot to lot. Sodium azide may also be used as a preservative. This substance is Resource Conservation and Recovery Act (RCRA) P-listed because it is considered a dangerous chemical for acute exposure.

## Steps to Identify Mercury

Examine your lab chemicals and reagents. Read container labels, Material Safety Data Sheets (MSDSs) and inserts that come with the reagents. MSDSs will generally not identify mercury levels below one percent, as manufacturers are not required to list

hazardous components of a product below this level. Contact your sales representatives and product manufacturers to ask about mercury in their products. Request a certificate of analysis (COA) or other data on the mercury concentration of their products. If mercury is not used as a preservative, ask if the mercury cell process is used during production. In evaluating kits consider each of the reagents separately.

When setting up purchase contracts, require disclosure of all hazardous materials in the reagents as part of the contract.

## Potential Mercury Containing Reagents

A wide variety of laboratory chemicals may contain mercury. This bulleted list from Health Care Without Harm (1997) gives you an idea of where to start looking for mercury in your lab reagents.

- Acetic acid
- Ammonium reagent/stone analysis kit
- Antibody test kits
- Antigens
- Antiserums
- Buffers
- Calibration kits
- Calibrators
- Chloride
- Diluents
- Enzyme immunoassay test kits
- Enzyme tracers
- Ethanol
- Extraction enzymes
- Fixatives (B5, Zenkers)
- Hematology reagents
- Hormones
- Immuno-electrophoresis reagents
- Immunofixation-phoresis reagents
- Immuno-sal
- Liquid substrate conjugate
- Negative control kits
- Phenobarbital reagent
- Phenytoin reagent
- Positive control kits
- Potassium hydroxide
- Pregnancy test kits
- Rabbit serum
- Shigella bacteria
- Sodium hypochlorite
- Stains
- Standards
- Sulfuric acid
- Thimerosal\*
- Tracer kits
- Urinalysis reagents
- Wash solutions

\* Thimerosal has many synonyms and trade names. For a list, see the link in this resource online.

## Evaluating Brand-specific Reagents

This list was compiled with assistance from the clinical laboratory staff at Park Nicollet Health Services. The data in this reference list was obtained from MSDSs, COAs, letters and manufacturers' Web sites. MnTAP maintains the following list of brand-specific, potential mercury-containing lab reagents solely as a service to Minnesota health care facilities. This is not a complete list of mercury-containing reagents.

Vendor / Manufacturer	Product	Mercury Concentration or Percent Thimerasol	Notes
Abbott Diagnostics Abbott Park, IL Technical Support 800/527-1869 abbottdiagnostics.com	<b>Aeroset Albumin BCG Kit #7D53</b> Reagent 1	130 ppm	Manufacturer letter, 8/04
	<b>Aeroset Methadone Kit #1E19</b> Reagent 1	0.043 ppb	
	<b>Aeroset Opiate Kit #1E20</b> Reagent 1	0.009 ppb	
	<b>Aeroset PCP Kit #1E21</b>	0.04 ppb	
	<b>Alcyon Albumin BCG Kit #8D23</b> Reagent 1	0.025%	Manufacturer product list and MSDS, 2/02
	<b>AUSAB EIA Kit #9006</b> B Surface Antigen Biotin Conjugate Anti-biotin conjugate	50 ppm 50 ppm	Manufacturer letter, 8/04
	<b>AUSZYME Monoclonal (MC) Kit</b> Conjugate Negative control Positive control	50 ppm 50 ppm 50 ppm	
	<b>AUSZYME MC Dynamic EIA Kit #7B17</b> Conjugate Negative control Positive control	0.01% 0.01% 0.009%	Manufacturer product list and MSDSs, 2/02
	<b>AxSYM Immunoassay Diagnostic Instrument</b> Mercury vapor lamp	Mercury vapor	Manufacturer letter, 8/04
	<b>Blood Screen Panels #1044</b> A-H J-N P-Q	0.01% 0.01% 0.01%	Manufacturer product list and MSDSs, 2/02
	<b>Clinical Chemistry Kit #1E66-01 and #1E66-02</b> Bilirubin Calibrator 1 and 2	10 ppm	Manufacturer letter, 8/04
	<b>Clinical Chemistry Kit #1E71</b> Urine/CSF Protein Calibrator	60 ppm	
	<b>CORZYME Kit #9977</b> Conjugate	50 ppm	
	<b>E coli Agglutinating Serum #9E49-01 to #9E66-01</b>	0.02%	Manufacturer product list and MSDS, 2/02
	<b>HCV EIA 2.0 Kit #4A14</b> Conjugate concentrate Conjugate diluent	50 ppm 50 ppm	Manufacturer letter, 8/04
	<b>HCV EIA Supplement Kit #4A81</b> Conjugate concentrate Conjugate diluent	0.01% 0.01%	Manufacturer product list and MSDS, 2/02
	<b>Hepatest-3 HA Confirmatory Kit #9E42-01</b> Antiserum, absorption cells, normal horse serum	0.01%	

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Abbott Diagnostics, continued	<b>Hepatest-3 HA Kit #8E62-01</b> Control cells and test cells	0.01%	Manufacturer product list and MSDSs, 2/02
	<b>Hepatitis B (HB) Antigens (Ag) HB Core Ag CORZYME Kit</b> Antibody to HB Core Ag Peroxidase conjugate	0.01%	
	<b>Hepatitis B Surface Antigen (HBsAg) AUSAB EIA Kit</b> Anti-biotin conjugate Biotin conjugate	50 ppm 50 ppm	
	<b>HBsAg Confirmatory Kit #1012</b> Negative control Confirmatory Reagent	50 ppm 50 ppm	Manufacturer letter, 8/04
	<b>HBsAg HA Kit #8E60-01</b> Control cells and test cells	0.01%	Manufacturer product list and MSDSs, 2/02
	<b>HBsAgI AUSAB Kit</b> Hep BS Ag I Negative control Positive control	None	Contains radioactive I and sodium azide 0.09%, a RCRA P-listed toxic substance, as a preservative.  Manufacturer product list and MSDSs, 2/02
	<b>HBsAg Sensitivity Panels #9108</b> A-G J-N P-S	Trace Trace Trace	Manufacturer product list and MSDSs, 2/02
	<b>Human Immunodeficiency Virus (HIV) AB HIV-1 EIA Kit #3A11</b> Conjugate Negative calibrator Positive calibrator	0.01% Trace Trace	
	<b>HIV AB-II MC Blocking Antibody Kit #3D16</b> Blocking antibody to HIV Control reagent	0.001% 0.001%	
	<b>HIV AG-1 Anti-rabbit IgG Conjugate #7042</b>	0.01%	
	<b>HIV AG-1 MC #1A01</b> Conjugate	0.009%	
	<b>HIV AG MC Blocking Antibody Kit</b> Blocking antibody to HIV Control reagent	50 ppm 0.001%	
	<b>HTLV-I 2.0 Kit #9A20</b> Conjugate concentrate Conjugate diluent Negative control Positive control	0.01% 0.009% 0.01% 0.001%	
	<b>IMx HBsAG Familiarization Panels #1B50</b> A-E	0.01%	Manufacturer product list and MSDSs, 2/02
	<b>IMx Immunoassay Diagnostic Instrument</b> Optical reading lamp	Mercury vapor	

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Abbott Diagnostics, continued	<b>LCx Immunoassay Diagnostic Instrument</b> Optical reading lamp	Mercury vapor	Manufacturer letter, 8/04
	<b>Murex Cryptococcus #8E15-01</b> Latex reagent	0.01%	Manufacturer product list and MSDSs, 2/02
	<b>Murex HBe Ag Standard #9E22-01</b> 4 U/ml standard	0.02%	
	<b>Murex HIV Antigen #8E77-01</b> Chromogen solution x100	0.02%	
	<b>Retrocell HIV-1 #4781</b> Negative control Positive control	0.01% 0.01%	
	<b>Rotazyme II Kit #7181</b> Conjugate Positive control Sample diluent	0.011% 0.011% 0.011%	
	<b>Salmonella H Agglutinating Serum #8E85-01, #9E98-01, #9E99-01, and #1F01-01 to #1F36-01</b>	0.02%	
	<b>Salmonella Typhi Vi Standards Serum #9E14-01</b>	0.01%	
	<b>Stained Suspensions #8E50-01 to #8E55-01, #9E28-01 to #9E38-01</b>	0.01%	
	<b>Syfacard #8E58-01 and #8E58-02</b> VDRL carbon antigen	0.099%	
	TDX Reagents	Possible	
	<b>TestPack HIV-1/HIV-2 #1A83</b> Negative control Positive control	0.01% 0.01%	Manufacturer product list and MSDSs, 2/02
	<b>TestPack Rotavirus #3186 and #6869</b> Positive control	0.01%	
	<b>Thrombo-Wellcotest Latex and Kit #8E23-01 and #8E26-10 Latex</b>	0.01%	
	<b>Unstained Suspension #9E39-01</b>	0.01%	
	<b>VDRL Carbon Antigens #8E56-01 and #8E57-01</b>	0.099%	
	<b>Vision Chemistry Calibrators Kit #1434</b> Calibrator B Calibrator C	0.001% 0.001%	
	<b>Vision HDL Cholesterol Controls Kit #1475</b> Control I Control II	0.001% 0.001%	
	<b>Wellcogen Antigen Kit #8E96-01 and #8E96-02</b> Positive control	1.015%	
	<b>Wellcogen H. Influenzae Type B #8E88-01 and #8E88-02</b> Positive control	1.015%	

Vendor / Manufacturer	Product	Mercury Concentration or Percent Thimerasol	Notes
Abbott Diagnostics, continued	<b>Wellcogen N. Meningitidis</b> #8E92-01 and #8E92-03 Positive control	1.015%	Manufacturer product list and MSDSs, 2/02
	<b>Wellcogen S. Pneumoniae</b> #8E90-02 and #8E91-01 Positive control	1.015%	
	<b>Wellcogen Strep B</b> #1F44-01 and #8E87-01 Positive control	1.015%	
	<b>Wellcozyme Anti-HCV Blot</b> #8E71-01 Reagent buffer concentrate Wash fluid concentrate	0.099% 0.099%	
	<b>Wellcozyme HIV Recombinant</b> #8E73-01 and #8E73-04 Conjugate x20 concentrate	0.01%	
Bayer Corporation Diagnostics Division Tarrytown, NY 914/631-8000 bayerdiag.com www.labnews.de	Cortisol 250 Test Kit	None	Sodium azide, a RCRA P-listed toxic substance, used as a preservative.  MSDSs, 1/98
	Estradiol-6 100 and 500 Test Kit		
	FSH 100 and 500 Test Kit		
	<b>HIV RNA 3.0 b DNA Assay Kit</b> HIV standards and controls Multi diluent 1, 2, 3, 9		
	Progesterone 50 Test Kit		
	Prolactin Test Kit		
	T3 80 and 400 Test Kit		
	T4 100 and 500 Test Kit		
Beckman Coulter, Inc. Miami, FL 800/526-7694 Chemistry 714/993-5321 Cytomerty 800/526-7694 Hematology 800/526-7694 beckman.com	<b>Hematology Products</b> 5C cell controls Coulter 4C Coulter-clenz Coulter Latron primer-1 Coulter scatter packs Isoton III Latron control Lyse S III differential reagent	None	Manufacturer tested, method SM 3112B, minimum detection limit (MDL)= 0.001 mg/L  Manufacturer letter, 9/00
	Latron control 2		
Becton, Dickinson and Company Franklin Lakes, NJ 877/603-1601 bd.com	<b>Reagents</b> Alkaescens Anti sera Avidin Biotin Bordetella Brucella Candida E coli Enzyme reagent Extraction reagent FA human globulin FA strep group A Febrile antigen Francisella Haemophilus Linker antibody Listeria Low reactive control	0.01%-0.10%	Manufacturer product list, 2/02

Vendor / Manufacturer	Product	Mercury Concentration or Percent Thimerasol	Notes
Becton, Dickinson and Company, continued	Negative control Neisseria Positive control Proteus RPR Salmonella (all) Serum blocker Shigella Streptavidin Streptococcus Trichinella Unopette Vibrio chlorae	0.01%-0.10%	Manufacturer product list, 2/02; manufacturer letter, 10/05
Bio-Rad Diagnostics Group Irvine, CA 949/598-1200 bio-rad.com	<b>Lyphocheck Quantitative Urine Control</b> #376, #377 <b>Lyphocheck Urine Metals Control</b> #400, #405 <b>Lyphocheck Whole Blood Metals Control</b> #527-#529	0.01%-0.1% 0.01%-0.1% 0.01%-0.1%	Quantitative urine and whole blood controls contain heavy metals in addition to mercury.  MSDSs, 5/05 and 8/05
CALTAG Technical Services Burlingame, CA 800/874-4007 caltag.com	<b>Goat Anti-human Igs</b> Monovalent #H14001 Polyvalent #H17001	None	Sodium azide, a RCRA P-listed toxic substance, used as a preservative.  COA from manufacturer and MSDSs, 2/02
Clorox Company Customer Service Oakland, CA 800/292-2200 clorox.com	Bleach	None	Information from manufacturer's senior environmental scientist, 2/02
Dade Behring, Inc. Customer Service Rhodes, IL 800/242-3233 www.dadebehring.com	<b>C-Reactive Protein (CRP) Reagent</b> CRP antibody particle concentrate CRP antibody particle diluent CPR buffer	0.005% 0.01% 0.002%	Sodium azide, a RCRA P-listed toxic substance, also used as a preservative  MSDSs, 7/03
	<b>Dade Dimension</b> Albumin BUN/urea nitrogen Coagulation controls Drug calibrator Gentamycin Flex Phenobarbital Flex Phenytoin Flex Quiklyte dilution check solution Salicylate Flex Reagent Cartridge Theophylline Flex	Possible Possible Possible 50 ppm 4 ppm 50 ppm 15 ppm 5 ppm 15 ppm 80 ppm	Proteinaceous. Products with a high amount of protein tend to contaminate easily and thimerosal is often used in them.  Sodium azide, a RCRA P-listed toxic substance, also used as a preservative.  Manufacturer letter, 8/04
	Diff Quik Stain Kit	None	Sodium azide used as a preservative.  Manufacturer technical bulletin, 3/00
	Digoxin Pretreatment 2	0.005%	Sodium azide used as a preservative.  MSDS, 7/03

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Dade Behring, continued	<b>Dimension Theo Flex Reagent Cartridge</b> Particle reagent Theo antibody reagent Theo buffer	0.01601% 0.002% 0.002%	Sodium azide used as a preservative. MSDS, 7/03
Diagnostic Products Corporation (DPC) Los Angeles, CA 800/372-1782 dpcweb.com	<b>Unconjugated Estriol Test Kit</b> LEF2 Reagent	<0.5%	Manufacturer technical bulletin and MSDS, 2/00
Fisher Scientific Diagnostics Middletown, VA 800/524-0294 fishersci.com	Immu-Sal	<1%	MSDS, 11/90
	MIF Vials	0.42%	MSDS, 12/04
	PVA-LV Fixative	4% mercuric chloride	MSDS, 3/03
Gen-Probe, Inc. San Diego, CA 800/523-5001 www.gen-probe.com	Pace 2 Chlamydia Kit	None	Manufacturer letter, 3/03
	Pace 2 Gonorrhea Kit		
	Pace 2C Detection Kit		
Immucor, Inc. (formally Gamma Biologicals) Norcross, GA 800/829-2553 immucor.com	Bovine Albumin 22%	None	Manufacturer letter and MSDS, 2/02
Medical Chemical Company Torrance, CA 800/424-9394 310/787-6800 www.med-chem.com	Hematoxylin 1 and 2	None	Manufacturer letter, 2/02
Meridian Bioscience, Inc. Cincinnati, OH 513/271-3700 meridianbioscience.com	ImmunoCard Toxins A and B	<0.02%	Manufacturer letter, 7/05
NERL Diagnostics Corporation East Providence, RI 800/556-7575 401/438-0386 nerl.com	S/P Blood Bank Saline 10L #B3158-3	None	Manufacturer letter, 2/05
Quidel Corporation Technical Support San Diego, CA 800/874-1517 quidel.com	CARDS QS Strep A Kit	None	Sodium azide used as a preservative. MSDS, 2/02
	<b>Chlamydia Kit</b> Extraction reagent B	<0.05%	MSDS, 9/03
	<b>CIC-C1q Enzyme Immunoassay Kit</b> Complement specimen diluent confirmation	0.1%	MSDSs, 2/02
	Conjugate, diluent and hydrating reagent	0.2%	
	HCG Pregnancy Kit (urine/serum)	None	Sodium azide used as a preservative. MSDS, 2/02
<b>H. Pylori Kit</b> Negative control Positive control	0.010% 0.10%	MSDS, 2/02	
Radiometer Westlake, OH 800/736-0600 www.radiometeramerica.com	Electrolyte for K+ Electrode	<0.005%	MSDS, 2/00

Vendor / Manufacturer	Product	Mercury Concentration or Percent Thimerasol	Notes
Remel Customer Service Lenexa, KS 800/255-6730 www.remelinc.com	<b>Campylobacter Microplate Assay Kit</b> Conjugate Dilution buffer Negative control Positive control Wash buffer	0.01% 0.02% 0.01% 0.02% 0.1%	Manufacturer Web site, 2/03
	<b>Cryptosporidium Microplate Assay Kit</b> Conjugate Dilution buffer Negative control Positive control Wash buffer	0.01% 0.02% 0.02% 0.02% 0.1%	
	<b>Entamoeba Histolytics Microplate Assay Kit</b> Conjugate Dilution buffer Negative control Positive control Wash buffer	0.01% 0.02% 0.02% 0.02% 0.1%	
	<b>Giardia Microplate Assay Kit</b> Conjugate Dilution buffer Negative control Positive control Wash buffer	0.01% 0.02% 0.02% 0.02% 0.1%	Manufacturer technical bulletin, 9/00
Simmler, Inc. High Ridge, MO 636/376-8347 simmler.com	<b>Fetal Cell Stain Kit</b> Citrate Buffer PMA	<1.0% phenylmercuric acetate	MSDS, 5/00
Sure Tech Diagnostic Associates St. Louis, MO 800/678-8933	<b>ST101 Fetal Hemoglobin - Part 2</b> Citrate/phosphate buffer	1% phenylmercuric acetate	MSDS, 10/05 Mercury-free substitute containing sodium azide available.
Wampole Laboratories Technical Services/Customer Service Princeton, NJ 800/257-9525 wampolelabs.com	Mono Test Kit	None	Manufacturer letter, 3/02

## For More Information

Hospitals for a Healthy Environment has information about mercury and how to eliminate its use in your facility, including policies to sustain the elimination. It sponsors an award for facilities that have essentially eliminated mercury <[www.h2e-online.org](http://www.h2e-online.org)>.

The Sustainable Hospitals Project, University of Massachusetts Lowell, offers information on selecting health care products that offer greater occupational safety and less environmental impact than some traditional products. These products include mercury-free alternatives <[www.sustainablehospitals.org](http://www.sustainablehospitals.org)>.

Checking online databases for mercury-containing products can give you an idea of which lab products

may contain mercury. These databases do not include all products that contain mercury, only those for which information has been submitted.

- Northeast Waste Management Officials' Association <[www.newmoa.org/newmoa/htdocs/prevention/mercury/imerc/notification/index.cfm](http://www.newmoa.org/newmoa/htdocs/prevention/mercury/imerc/notification/index.cfm)>.
- Medical Academic and Scientific Community Organization <[www1.netcasters.com/mercury](http://www1.netcasters.com/mercury)>

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs. Our information resources are available online at <[mntap.umn.edu](http://mntap.umn.edu)>. Or, call MnTAP at 612/624-1300 or 800/247-0015 from greater Minnesota for personal assistance.