

Certificate of Laboratory Tests



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Korea Environment & Merchandise Testing Institute
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Ref No: 1MW08-00003

Client : Korea Electric Testing Institute

Address: 692-8 Keunjeong Dong, Kunpo Si, Kyeongki

Sample Name: Water Ionizer (AMS2000)

Issue date: 14. 07. 2008

Test date: 14. 07. 2008

Application date: 18. 06. 2008

Purpose: For model approval

Test results

Please refer to the following pages for the test results

Test Trier: H. J. Suk

Tech-responsible person: K. H. Yoo

CEO & President of Korea Environment & Merchandise Testing Institute

Ref No: 1MW08-0003

Output Water Safety Test

Test item	Unit	Drinking water quality standard	Quantitative limit	Test results
Total Colony Counts	CFU/mL	Below 100	0	0
Total Coliforms	-(/100mL)	ND	-	ND
E. coli	-(/100mL)	ND	-	ND
Pb	mg/L	Below 0.05	0.04	ND
F	mg/L	Below 1.5	0.15	ND
As	mg/L	Below 0.05	0.005	ND
Se	mg/L	Below 0.01	0.005	ND
Hg	mg/L	Below 0.001	0.001	ND
CN	mg/L	Below 0.01	0.01	ND
Cr ⁶⁺	mg/L	Below 0.05	0.02	ND
NH ₃ -N	mg/L	Below 0.5	0.01	ND
NO ₃ -N	mg/L	Below 10	0.1	1.2
Cd	mg/L	Below 0.01	0.002	ND
B	mg/L	Below 0.3	0.01	ND
Phenol	mg/L	Below 0.005	0.005	ND
Diazinon	mg/L	Below 0.02	0.0005	ND
Parathion	mg/L	Below 0.06	0.0005	ND
Fenitrothion	mg/L	Below 0.04	0.0005	ND
Carbaryl	mg/L	Below 0.07	0.0005	ND
Total trihalomethane (inlet water)	mg/L	Below 0.1	0.001	0.02
Total trihalomethane (output water)	mg/L	Below 0.1	0.001	ND
Chloroform	mg/L	Below 0.08	0.0001	ND
1.1.1-Trichloroethane	mg/L	Below 0.1	0.001	ND
Tetrachloroethylene	mg/L	Below 0.01	0.001	ND
Trichloroethylene	mg/L	Below 0.03	0.001	ND
Dichloromethane	mg/L	Below 0.02	0.002	ND

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Test item	Unit	Drinking water quality standard	Quantitative limit	Test results
Benzene	mg/L	Below 0.01	0.001	ND
Toluene	mg/L	Below 0.7	0.001	ND
Ethylbenzene	mg/L	Below 0.3	0.001	ND
Xylene	mg/L	Below 0.5	0.001	ND
1,1-Dichloroethylene	mg/L	Below 0.03	0.001	ND
Carbon Tetrachloride	mg/L	Below 0.002	0.001	ND
Residual Chlorine	mg/L	Below 4.0	0.05	ND
Chloral Hydrate	mg/L	Below 0.03	0.0005	ND
Dibromoacetonitrile	mg/L	Below 0.1	0.0005	ND
Dichloroacetonitrile	mg/L	Below 0.09	0.0005	ND
Trichloroacetonitrile	mg/L	Below 0.004	0.0005	ND
1,2-Dibromo-3-chloropropane	mg/L	Below 0.003	0.001	ND
Haloaceticacid	mg/L	Below 0.1	0.0005	ND
Hardness	mg/L	Below 300	1	56.2
Consumption of KMnO ₄	mg/L	Below 10	0.3	1.26
Odor	-	Odorless	-	Odorless
Taste	-	Tasteless	-	Tasteless
Cu	mg/L	Below 1.0	0.008	ND
Color	degree	Below 5	1	ND
Detergent	mg/L	Below 0.5	0.1	ND
Zn	mg/L	Below 1.0	0.002	ND
Cl ⁻	mg/L	Below 250	0.4	13
Total solids	mg/L	Below 500	2	96
Fe	mg/L	Below 0.3	0.05	ND
Mn	mg/L	Below 0.3	0.005	ND
Turbidity	NTU	Below 1	0.02	0.12
SO ₄ ⁻²	mg/L	Below 200	2	15
Al	mg/L	Below 0.2	0.02	ND

- Test Method: As per client's provided standard requirements.
- Use tap water available at the laboratory.
 - Have 2 Liter tap water flow down to the sink before testing.
 - Test 'alkaline ionized water' obtained only at the highest pH level 4.

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Elution Test

Test Item		Unit	Standard required	Test results
Elution test	Heavy metal: as Pb	mg/L	Below 1.0	Below 1.0
	KMnO ₄ consumption		Below 10	1
	Total solids: as distilled water		Below 30	10
Test Method		As per Korean Food Code No. 7 (instruments etc)		

MATERIAL SAFETY DATA SHEET

No. 1/2

Revised Date : MAY 24, 2006

Product Name : ACTIVATED CARBON 「KURARAYCOAL T-SB」

Section I

Manufacturer's name : KURARAY CHEMICAL CO., LTD.
Address : 4342, Tsurumi, Bizen City, Okayama, Japan
Telephone No. : 0869-65-8331
Chemical Name and Synonyms : Activated Carbon
Formula : C

Section II - Hazardous Ingredients

Ingredients : Carbon : silver
CAS No. : 7440-44-0 : 7440-22-4
UN Number : Non-Correspondence : 3089
Percent : >92% : 0.06 - 0.10% (As silver)
TLV (ACGIH) : N/A : -
PRTR object quality : Non-Correspondence : Correspondence

Section III - Physical Data

Boiling point (°C) : N/A
Vapor pressure (mmHg) : N/A
Vapor density (Air=1) : N/A
Solubility in water : Insoluble
Specific gravity (H₂O=1) : 1.8 - 2.2
Percent volatile by volume (%) : N/A
pH : 5 - 8.5
Packing density (g/cc) : >0.35
Appearance and odor : odorless, black granular solid

Section IV - Fire and Explosion Hazard Data

Flash point : N/A
Extinguishing Media : Foam, Multipurpose Dry Chemical and water Type Extinguishers.
Special fire fighting procedure : None.
Unusual fire and explosion hazards : Avoid contacting with Strong oxidizers such as Ozone, Liquid oxygen, permanganate, etc.
Auto-ignition Point : >250°C.
(Activated carbons, that have adsorbed organic liquids and gases may lower the ignition point.)

Section V - Reactivity Data

Stability	:Stable.
Incompatibility (Materials to avoid)	:Strong Oxidizers such as Ozone, Liquid Oxygen, Permanganate, Nitric Acid etc.
Hazardous Polymerization	:May not occur.
Conditions to Avoid	:Wet activated carbon removes oxygen from air causing a Severe hazard to workers inside carbon vessels and enclosed or confined spaces.
Hazardous decomposition products	:contact with strong inorganic acids such as nitric acid and sulfuric acid may generate hazardous gases such as NO ₂ and SO ₂ .

Section VI - Environmental Information

Spill resource	:Sweeping or Vacuuming (Spills can create nuisance dust and house keeping problems, Then vaccuming is better clean up problems.)
Recommended disposal	:Disposal of in accordance with local, State, and federal regulation.

Section VII - Environmental Information

Suggested first aid	
Eye contact	:Flush with plenty of water, and prompt medical care is recommended.
Skin contact	:Wash with soap and water
Inhalation	:When inhale the dust of activated carbon, rinse mouth with water.
If swallowed	:The product is non-toxic and cannot swallow in large quantity.
Effect of overexposure	:Avoid exposure to dust levels above 2.9 mg per cubic meter. Long-term exposure to the dust may bring about the pneumoconiosis.

Section VIII - Handling and Storage

Protective gloves	:Rubber gloves recommended.
Eye protection	:Goggles recommended.
Respiratory protection	:NIOSH Approved particular filter respirator is recommended if excessive dust is generated.
Ventilation	:Local exhaust is recommended.
Storage precaution	:Packaged activated carbon is not resistant to weather or outside storage and requires indoor storage facilities.

Concluded