SAPIENZA
UNIVERSITÀ DI ROMA

Department of Public Health and Infectious Diseases
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Rome, January 13, 2025

CHEMICAL AND PHYSICO-CHEMICAL ANALYSIS OF MINERAL WATER

Name of mineral water: Filette

Location: Filette, Guarcino LAT 41.802952N, LONG 13.322689E

Withdrawal on: 08/11/2024 ASL report attached

Prot. no. 67/2024 of 08/11/2024

Analysis execution date: from 08/11/2024 to 30/12/2024

1. Parameters determined at source

1.1 Organoleptic characteristics

Color:	colorless
I wait:	clear
Sediment:	absent
Odor:	not perceptible
Taste:	pleasant
Turbidity	absent

1.2 Temperature

Air (°C):	10.5
Water at source (°C):	12.1

1.3 pH (source temperature)

Water at source (pH units):	7.58

1.4 Free carbon dioxide

Source water (mg/L):	22

2. Parameters referred to in article 2 paragraph 3 of the Ministerial Decree 10/02/2015 and subsequent amendments

Parameter	Unit of measure	Methodology	Result	Limit of detectability
Temperature at the source	°C	APAT IRSA/CNR ed. 29/2003 n° 2100	12.1	-
Hydrogen ion concentration (pH) at source water temperature	pH unit	APAT IRSA/CNR ed. 29/2003 n° 2060	7.58	-
Specific electrical conductivity (20°C)	µS x cm^{-1}	APAT IRSA/CNR ed. 29/2003 n° 2030	404	-
Fixed residue at 180°C	mg/L	APAT IRSA/CNR ed. 29/2003 n° 2090	230	10
Oxidability	mg/L_2	ISS.BEB.027.rev00 ISTISAN Reports 07/31	< 0.50	0.50
Free carbon dioxide at source	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4010	22	5
Silica	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	2.0	0.04
Hydrocarbon ions (bicarbonates)	mg/L	APAT IRSA/CNR ed. 29/2003 n° 2010	247	6
Chloride ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4090°A1	6.8	0.4
Sulphate ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4140	4	1
Sodium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	3.2	0.1
Potassium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.2	0.2
Calcium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	89	0.1
Magnesium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	1.3	0.1
Iron ions (dissolved)	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.1	0.1
Ammonium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4030	< 0.05	0.05
Total phosphorus	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4110	< 0.1	0.1
Sulphide grade (hydrogen sulphide - H_2S)	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4160	< 0.2	0.2
Strontium ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	0.07	0.01
Lithium ion	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	0.03	0.01
Aluminum ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.1	0.1
Bromide ions	mg/L	Standard Methods 20th edition method 4500-Br- B	< 0.1	0.1
Iodide ions	mg/L	Standard Methods 20th edition method 4500-I-C	< 0.01	0.01

3. Other chemical and chemical-physical parameters of water

Parameter	Unit of measurement	Methodology	Result	Limit of detectability
pH in laboratory (18°C)	pH unit	APAT IRSA/CNR ed. 29/2003 n° 2060	7.85	-
Hardness - total - calculated (calcium and magnesium)	French degrees (°F)	APAT IRSA/CNR ed. 29/2003 n° 2040	20.0 22.7	1.0 -
Total Alkalinity	ml HCl 0.1 N/L	APAT IRSA/CNR ed. 29/2003 n° 2010	40.5	1

4. Parameters referred to in article 2 paragraph 4 of the Ministerial Decree 10/02/2015 and subsequent amendments

Parameter	Unit of measure	Methodology	Result	Limit of detectability	Accuracy %	Precision %
Antimony	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3060	< 0.0005	0.0005	25	25
Arsenic	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3080	< 0.001	0.001	10	10
Barium	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.01	0.01	25	25
Boron	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.1	0.1	10	10
Cadmium	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.0003	0.0003	10	10
Chrome	mg/L $Cr_{(total)}$	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.005	0.005	10	10
Copper	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.01	0.01	10	10
Cyanide ions	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4070	< 0.001	0.001	10	10
Fluoride ions	mg/L	Standard Methods 20th edition method 4500-F-D - SPADNS	< 0.10	0.10	10	10
Lead	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3230	< 0.001	0.001	10	10
Manganese	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.01	0.01	10	10
Mercury	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3200	< 0.0001	0.0001	20	10
Nickel	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3020	< 0.002	0.002	10	10
Nitrate ions (nitrates)	mg/L	Standard Methods 20th edition Method 4500-NO_3B	0.2	0.1	10	10
Nitrous ions (nitrites)	mg/L	APAT IRSA/CNR ed. 29/2003 n° 4050	< 0.002	0.002	10	10
Selenium	mg/L	APAT IRSA/CNR ed. 29/2003 n° 3260	< 0.001	0.001	10	10

5. Parameters referred to in article 2 paragraph 6 of the Ministerial Decree 10/02/2015 and subsequent amendments

Parameter	Unit of measure	Methodology	Result	Limit minimum of performance
Surfactants	-g/L	APAT IRSA/CNR ed. 29/2003 n° 5170	nd or absent	50
Mineral oils	-g/L	Standard Methods 20thedition Method 5520 C	nd or absent	10
Benzene	-g/L	ISS.CAD.004.rev00 ISTISAN Reports 07/31	nd or absent	0.5
Polycyclic aromatic hydrocarbons	-g/L	ISS.CAB.039.rev00 ISTISAN Reports 07/31		
Acenaphthene			nd or absent	0.006
Acenaphthylene			nd or absent	0.006
Anthracene			nd or absent	0.006
Benzo(a)anthracene			nd or absent	0.006
Benzo(a)pyrene			nd or absent	0.003
Benzo(b)fluoranthene			nd or absent	0.006
Benzo(g,h,i)perylene			nd or absent	0.006
Benzo(k)fluoranthene			nd or absent	0.006
Chrysene			nd or absent	0.006
Dibenzo(a,h)anthracene			nd or absent	0.006
Phenanthrene			nd or absent	0.006
Fluoranthene			nd or absent	0.006
Fluorine			nd or absent	0.006
Indeno(1,2,3-c,d)pyrene			nd or absent	0.006
Naphthalene			nd or absent	0.006
Pyrene			nd or absent	0.006
Pesticides*	-g/L	ISS.CAC.015.rev01 ISTISAN Reports 19/7		
Alachlor			nd or absent	0.05
Ametrine			nd or absent	0.05
Bentazone			nd or absent	0.05
Chlorpyrifos			nd or absent	0.05

DDT			nd or absent	0.05
Hexachlorobenzene			nd or absent	0.05
Lindane gamma			nd or absent	0.05
Metalaxyl			nd or absent	0.05
Metolachlor			nd or absent	0.05
Oxadixyl			nd or absent	0.05
Pentachlorobenzene			nd or absent	0.05
Terbuthylazine			nd or absent	0.05
Aldrin			nd or absent	0.01
Dieldrin			nd or absent	0.01
Heptachlor			nd or absent	0.01
Heptachlor epoxide			nd or absent	0.01
Polychlorinated biphenyls (PCBs)	-g/L	Extraction: EPA 525.1 determination: APAT IRSA/CNR ed. 29/2003 n° 5110		
3,3',4,4' tetrachlorobiphenyl (PCB 77)			nd or absent	0.05
3,4,4',5 tetrachlorobiphenyl (PCB 81)			nd or absent	0.05
2,3,3',4,4' pentachlorobiphenyl (PCB 105)			nd or absent	0.05
2,3,4,4',5 pentachlorobiphenyl (PCB 114)			nd or absent	0.05
2,3',4,4',5 pentachlorobiphenyl (PCB 118)			nd or absent	0.05
2',3,4,4',5 pentachlorobiphenyl (PCB 123)			nd or absent	0.05
3,3',4,4',5 pentachlorobiphenyl (PCB 126)			nd or absent	0.05
2,3,3',4,4',5 hexachlorobiphenyl (PCB 156)			nd or absent	0.05
2,3,3',4,4',5 hexachlorobiphenyl (PCB 157)			nd or absent	0.05
2,3',4,4',5,5' hexachlorobiphenyl PCB 167)			nd or absent	0.05
3,3',4,4',5,5' hexachlorobiphenyl (PCB 169)			nd or absent	0.05
2,3,3',4,4',5,5' heptachlorobiphenyl PCB 189)			nd or absent	0.05
Organohalogen compounds (not falling under entries 5 and 6)	-g/L	ISS.CAA.036.rev00 ISTISAN Reports 07/31		
chloroform	-		nd or absent	0.5
dichlorobromomethane	-		nd or absent	0.5

chlorodibromomethane	-		nd or absent	0.5
bromoform	-		nd or absent	0.5
1,1 dichloroethane	-		nd or absent	0.1
1,2 dichloroethane	-		nd or absent	0.1
1,1 dichloroethylene	-		nd or absent	0.1
trans 1,2 dichloroethylene	-		nd or absent	0.1
1,1,1 trichloroethane	-		nd or absent	0.1
1,1,2 trichloroethane	-		nd or absent	0.1
trichloroethylene	-		nd or absent	0.1
tetrachloroethylene	-		nd or absent	0.1
1,2 dichloropropane	-		nd or absent	0.1
cis 1,3 dichloropropene	-		nd or absent	0.1
trans 1,3 dichloropropene	-		nd or absent	0.1
carbon tetrachloride	-		nd or absent	0.1
1,1,2,2 tetrachloroethane	-		nd or absent	0.1

* The competent local authority has communicated that in the territory influencing the resource concerned, no pesticides are used. Therefore, the active ingredients found in the underground waters of the Lazio Region by ARPA have been subjected to checks

6. Characterizing components of the residue of a litre of water

NAME	FORMULA	mg
Silica	YesO2	2.0
Carbonate ions	CO3	121
Chloride ions	Cl-	6.8
Sulphate ions	I KNOW4-	4
Sodium ions	No+	3.2
Calcium ions	About2+	89
Magnesium ions	mg2+	1.3
Strontium ions	Mr.2+	0.07
Residue calculated from analytical data Fixed residue at 180° Difference		228 230 (0.9%)

7. Classification

Pursuant to Legislative Decree 08 October 2011 n° 176*Implementation of Directive 2009/54/EC on the use and marketing of natural mineral waters*, the natural mineral water called:

Filets

It can be classified as

natural mineral water with low mineral content, suitable for low sodium diets.

(Prof. Matteo Vitali)