



# AUTHORS

DE GRACIA HILS J.A.<sup>1,3,4</sup>, DE GRACIA HILS Y.<sup>1,3</sup>,  
CARPINTERO CATERIANO A.<sup>2</sup>, , ARMIJO, F.<sup>3,4</sup>  
MARAVER EYZAGUIRRE F.<sup>3,4</sup>

- <sup>1</sup> Balneario De Ariño, Ariño, Spain.
- <sup>2</sup> Servicio Aragonés de Salud, Spain.
- <sup>3</sup> Sociedad Española de Hidrología Médica.
- <sup>4</sup> Professional School of Medical Hydrology,  
Complutense University, Madrid, Spain



# Introducción

## Introduction

**Natural mineral waters** defined as subterranean origin with a constant composition their special characteristics, have been officially confirmed as therapeutic agents and public utility declared by the pertinent organisms. (1)

**Health resort center** provides treatment with Natural Mineral water on Reumathologic and pain related, digestive care, Urinary tract, dermatology and respiratory care.

The aim is to introduce Physicians who are not Hydrologists the diferent types of Natural mineral water.



Natural Mineral waters with therapeutic properties in Spain		
	mg/L	Compound
Calcium	500	Ca <sup>2+</sup>
Magnesium	150	Mg <sup>2+</sup>
Bivalent Iron	20	Fe <sup>2+</sup>
Lithium	2	Li <sup>+</sup>
Sulphate	1200	SO <sub>4</sub> <sup>2-</sup>
Bicarbonate	1300	HCO <sub>3</sub> <sup>-</sup>
Iodide	1	I <sup>-</sup>
Fluor	1	F <sup>-</sup>
Hydrogen Sulphide	1	(HS <sup>-</sup> , H <sub>2</sub> S, HS <sub>x</sub> <sup>-</sup> )
Carbon dioxide	1000	CO <sub>2</sub>
Radon	666 Bq/L	Rn
Saline water	8.5 g	Cl <sup>-</sup>

Tabla 1. Natural mineral water with therapeutic properties in Spain (2)

Methods:

Classification on temperature:

1. Hypothermal < 35 °C
2. Mesothermal 35-37 °C
3. Hyperthermal > 37 °C

Classification on global mineralization (fixed residue contents at 110 °C)

1. Oligomineral Less than 100 mg/L
2. Very weak mineralization 100-250 mg/L
3. Weak mineralization 250-500 mg/L
4. Medium mineralization 500-1000 mg/L
5. Strong mineralization 1000 mg/L

Classification on Mineral components; (>1 gr global mineralization based on anion cation content):

1. Chlorided > 20 % mEq
2. Sulphated > 20 % mEq
3. Bicarbonates > 20 % mEq
4. Sodium > 20 % mEq
5. Calcium > 20 % mEq
4. Ferruginous > 5 mg/L total Fe.
5. Sulphur >1 mg/L sulfur reduced form SH<sub>2</sub> and SH<sup>-</sup>
6. Carbogaseous 250mg/L CO<sub>2</sub> free.
7. Radioactive 67,3 Bq/L radon

Classification on Hardness

1. Very soft 0-100 mg/L CaCO<sub>3</sub>
2. Soft 100-200 mg/L CaCO<sub>3</sub>
3. Hard 200-300 mg/L CaCO<sub>3</sub>
4. Very Hard 300-400 mg/L CaCO<sub>3</sub>
5. Extremely Hard >400mg/L CaCO<sub>3</sub>



Image 1. Map of Natural mineral water classification and Health resort center to treat specific pathologies on Spain. (3)

## Results

analysis and classification systems name the different natural mineral waters and use for therapeutic purposes.

## Conclusión

Natural mineral water classification and analysis can be helpful to asses patient on health care treatment and prevention.

Health resort centers in Spain are classified by type of water and pathologies to be treated on.

A quick guide to non Hydrologist Physician can be used to refer patient.

## REFERENCES

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