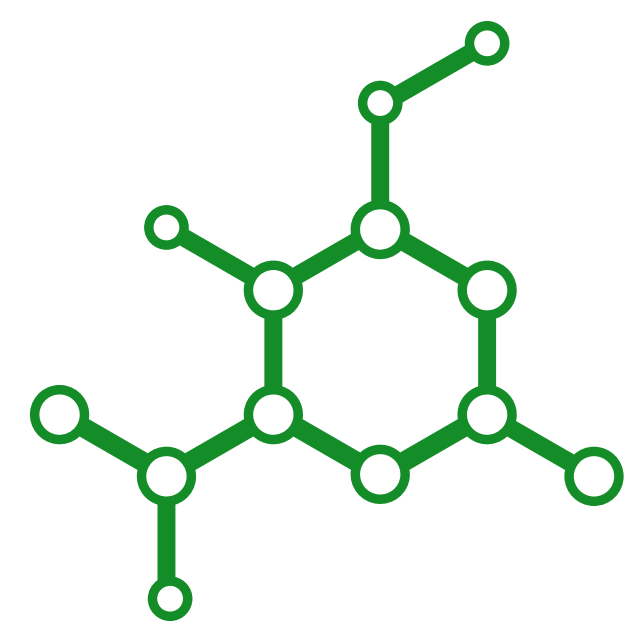
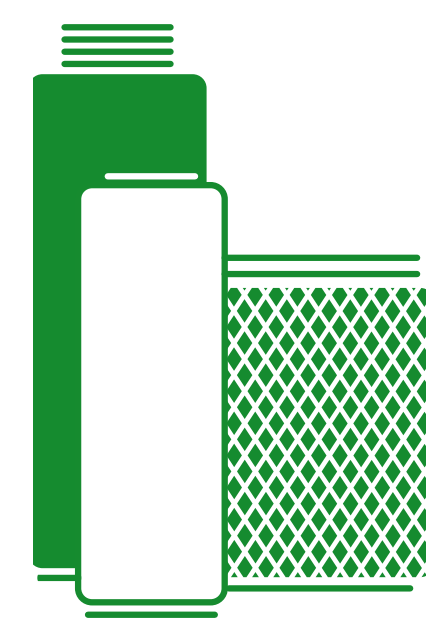


# ARAGON

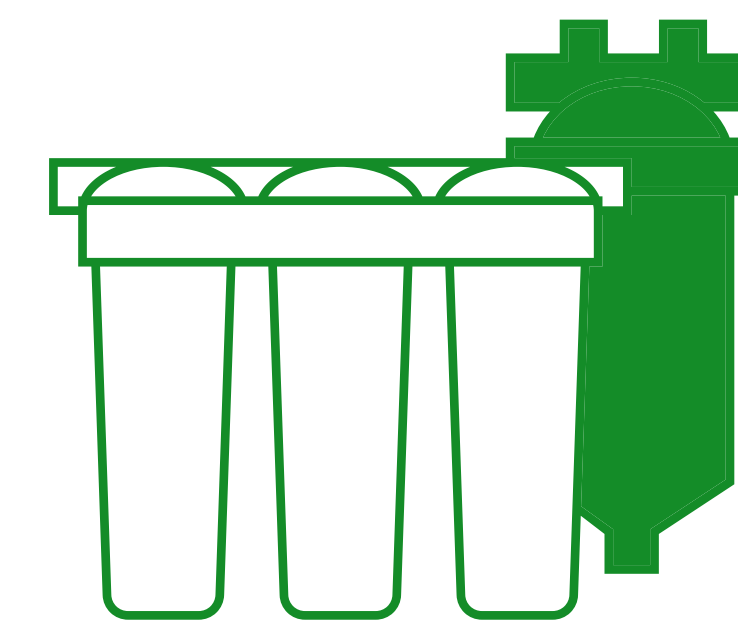
TECHNOLOGIES



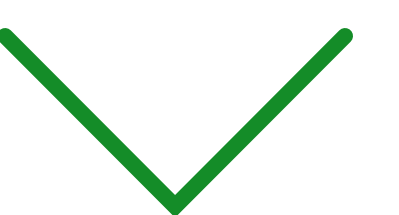
MODIFICATIONS



APPLICATION



ADVANTAGES



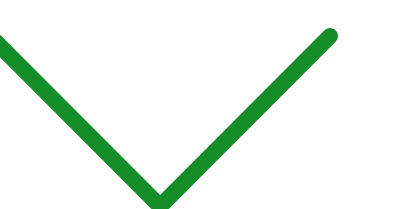
# TECHNOLOGIES



FILTRATION MATERIAL

QUASI-SOFTENING

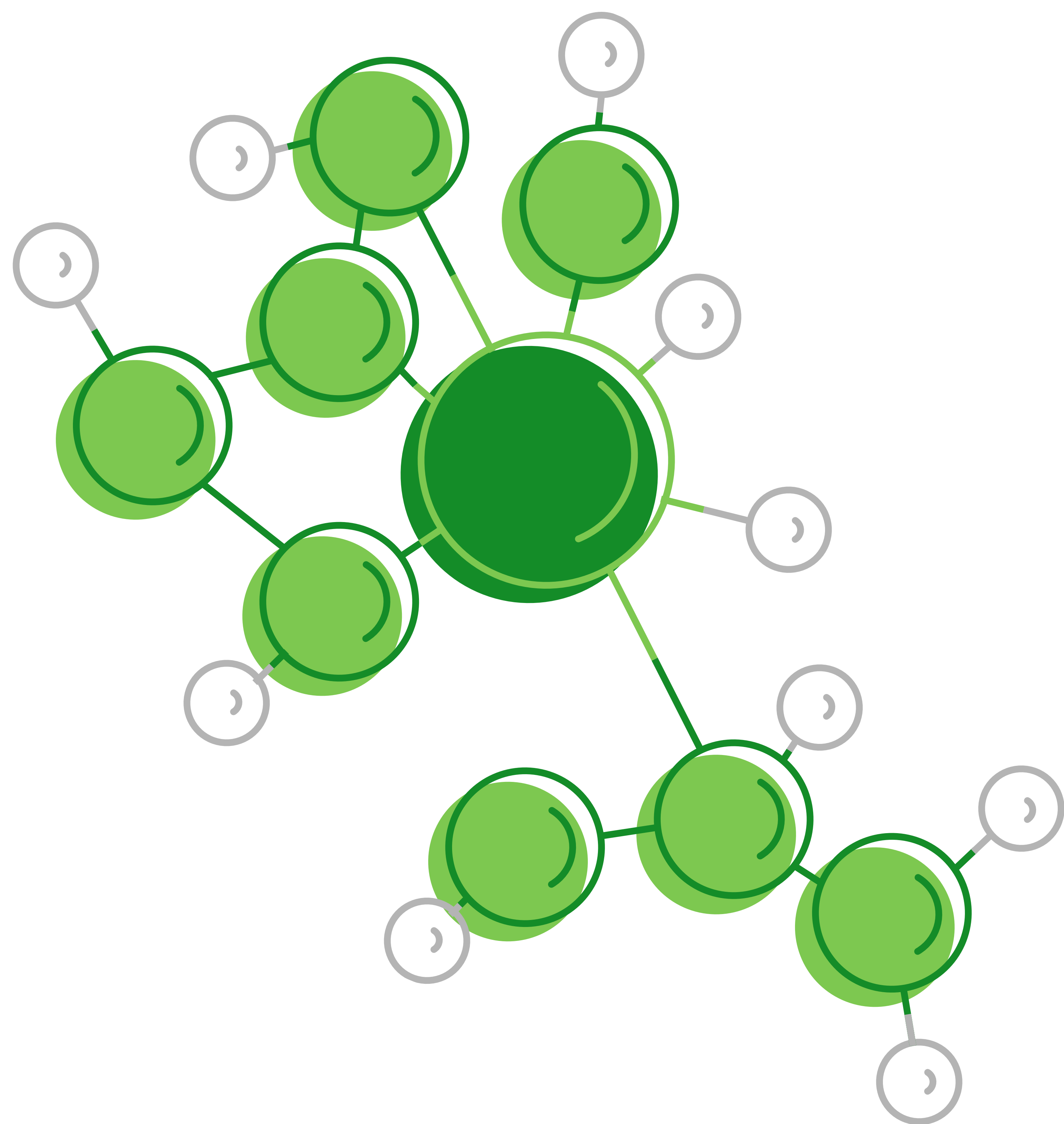
TREATMENT METHODS





FILTRATION  
**MATERIAL**



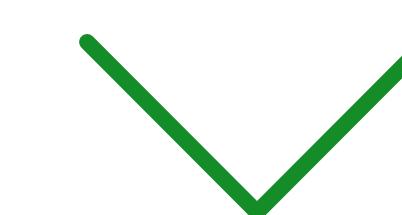


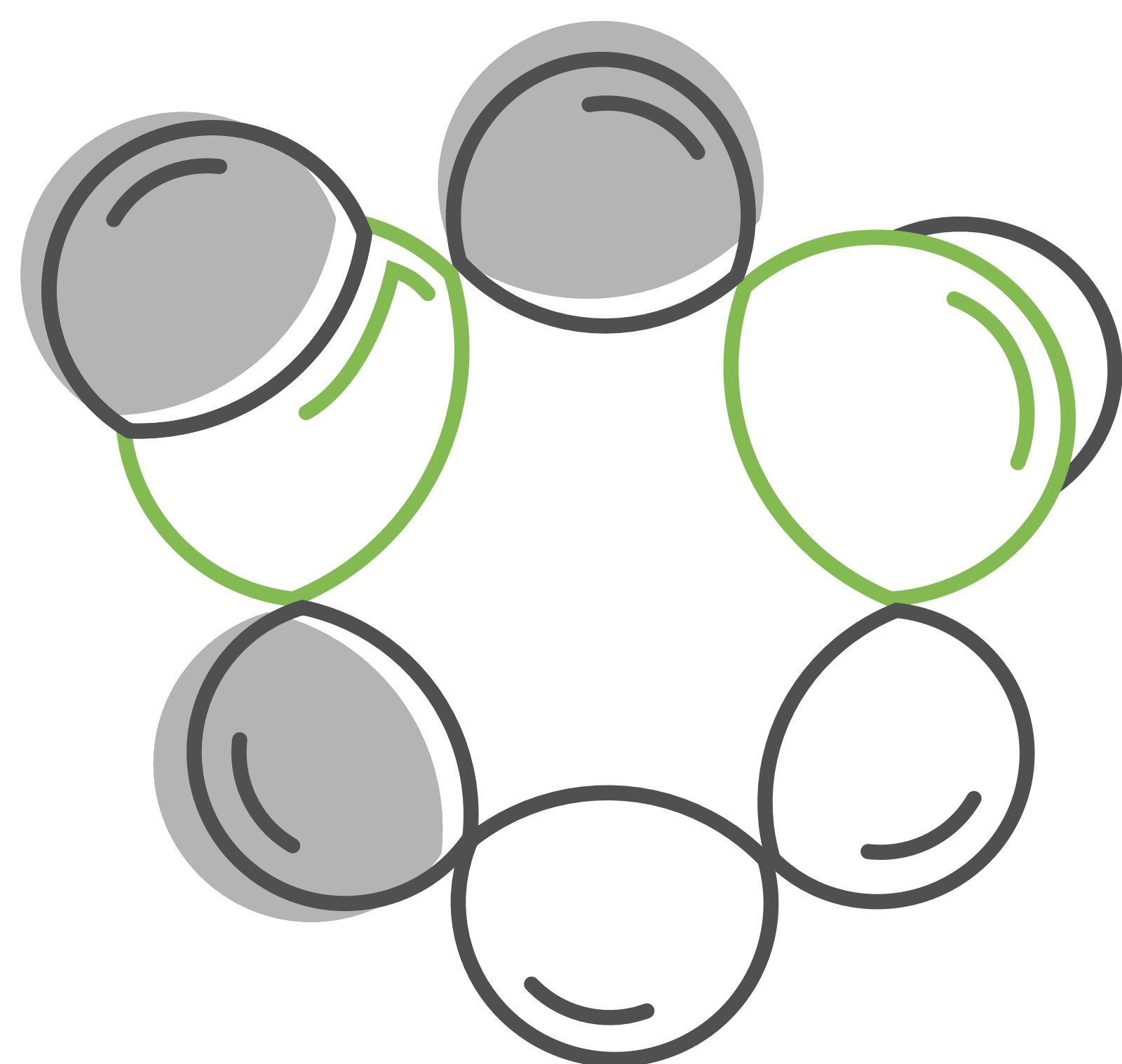
# SGS

## SGS – POLYMERS (SPACE-GLOBULAR- STRUCTURE)

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High molecular compounds with cation –  
and anion-exchange properties.





## ARAGON

The composite polymeric material structured as a single block combined with silver as a bacteriostatic agent.

Invention Patent:

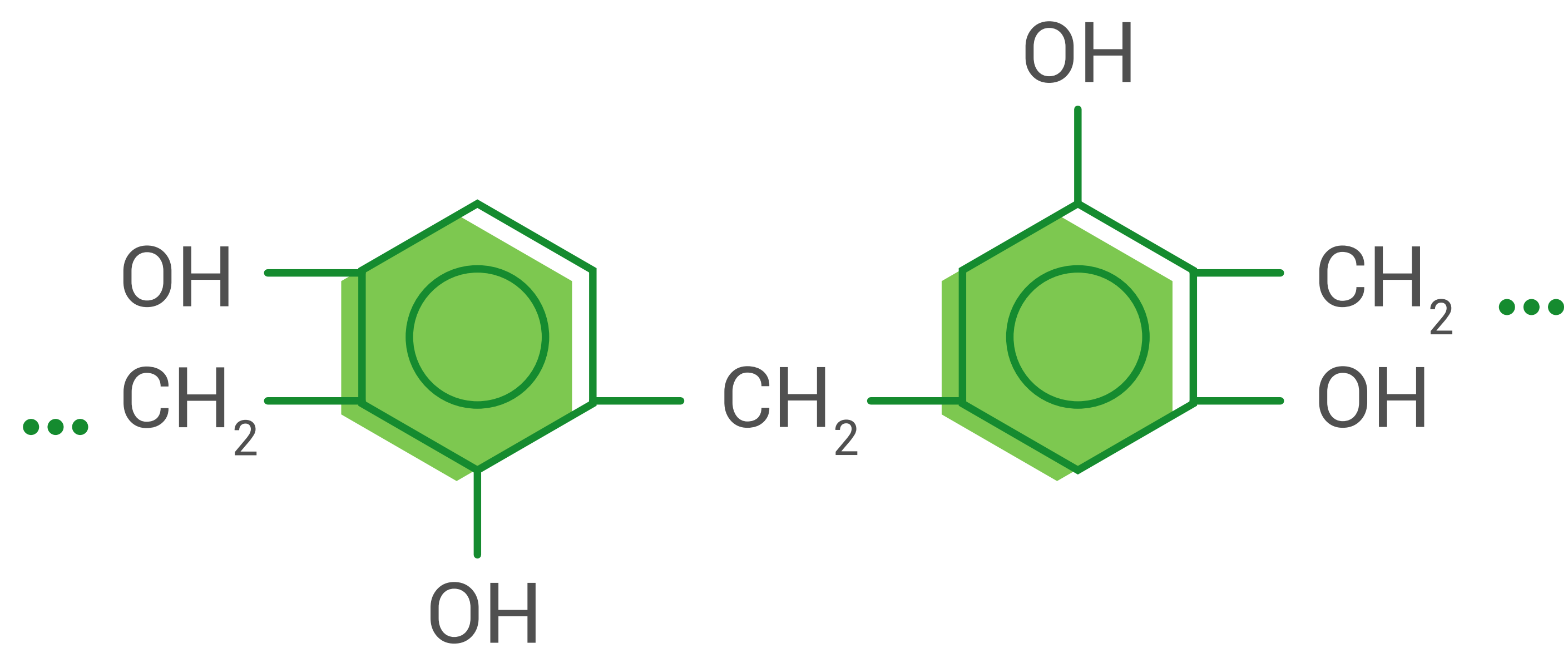
Nº 2286354

Nº 2287356

Nº 2297270

Nº 2299087

Resorcin— m-Dihydroxybenzene

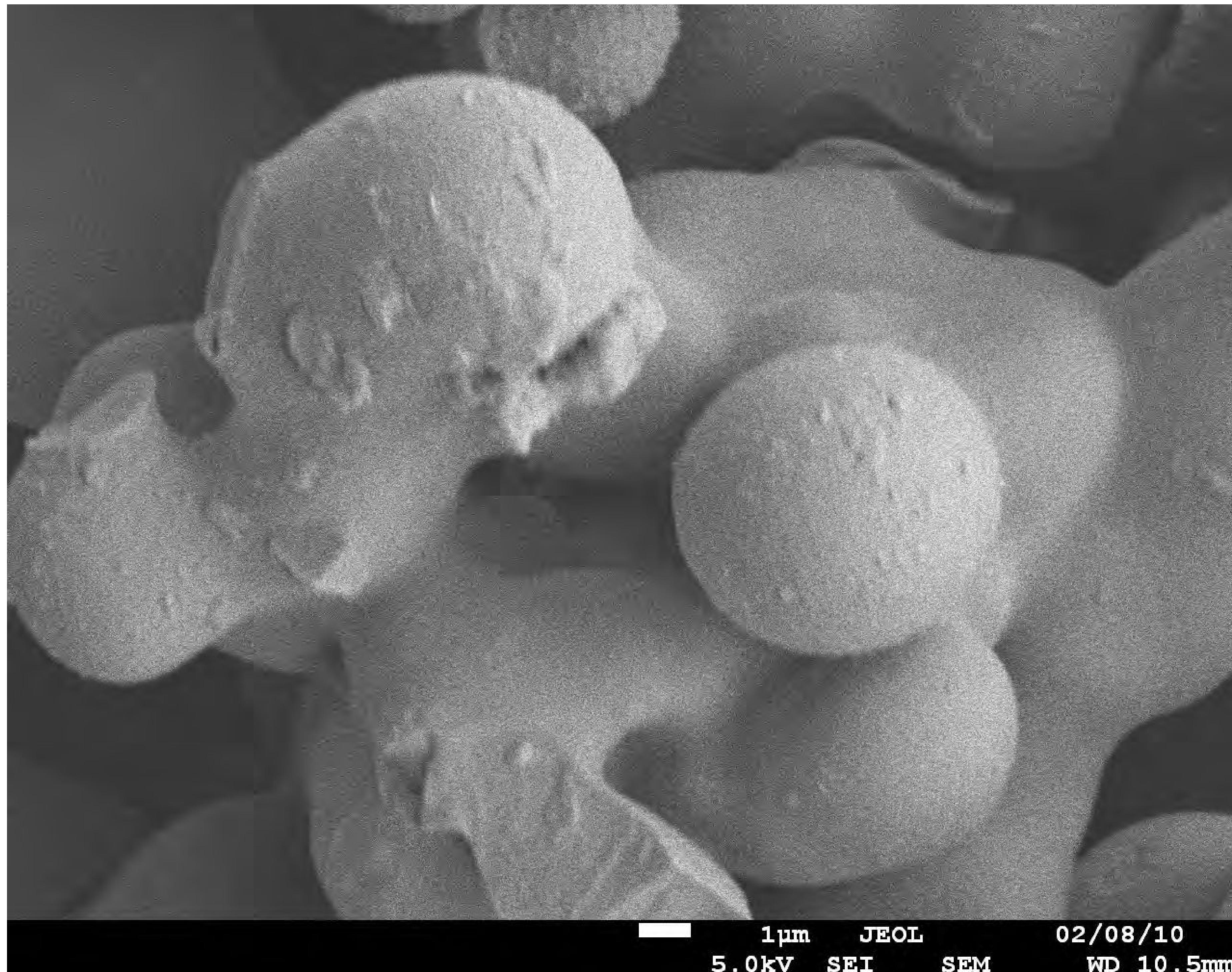


The resorcin-based polymer shows the best results in removing contaminants from water.





1  $\mu\text{m}$

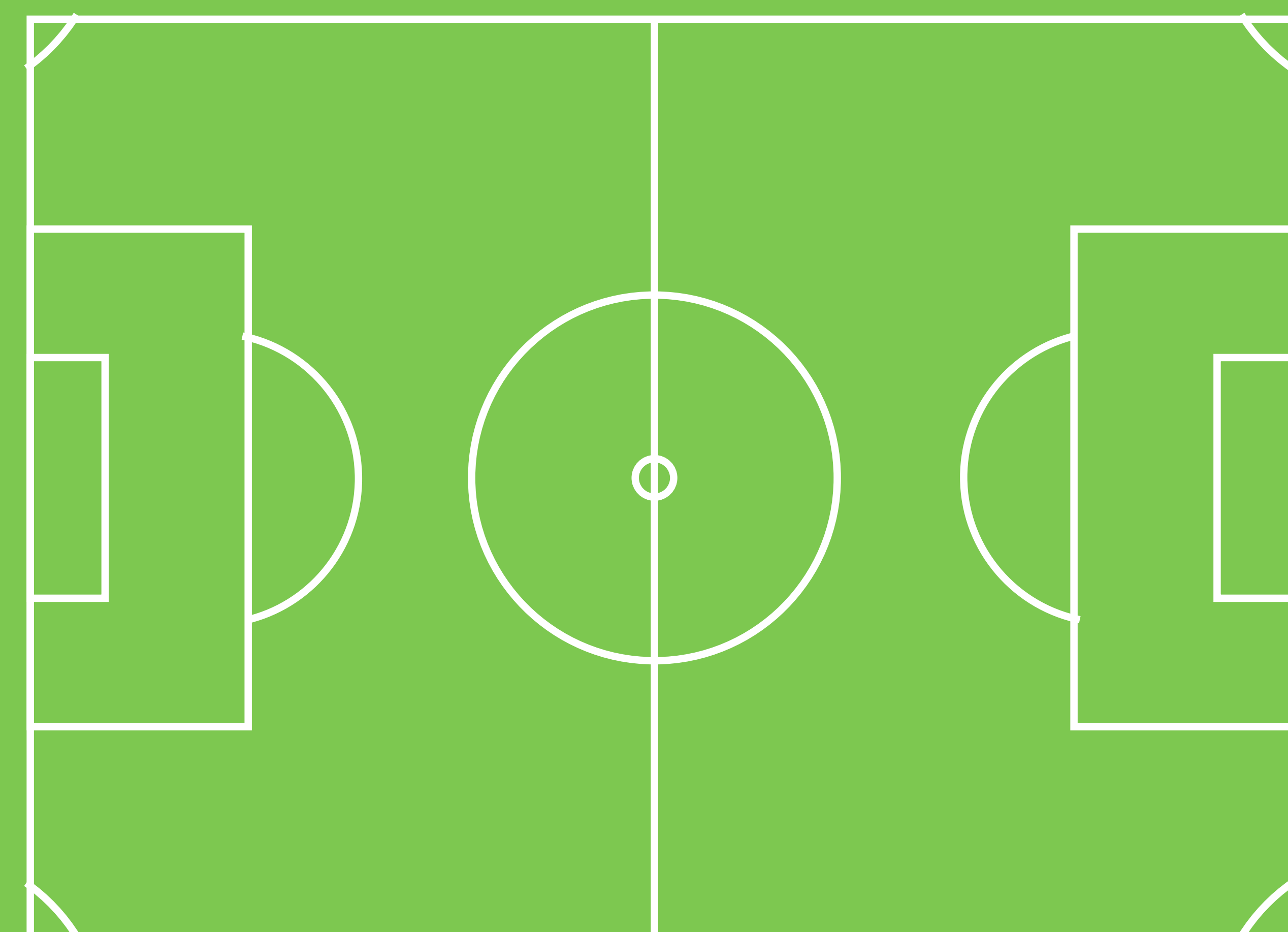


There are active ion-exchange groups on the globules' surface.

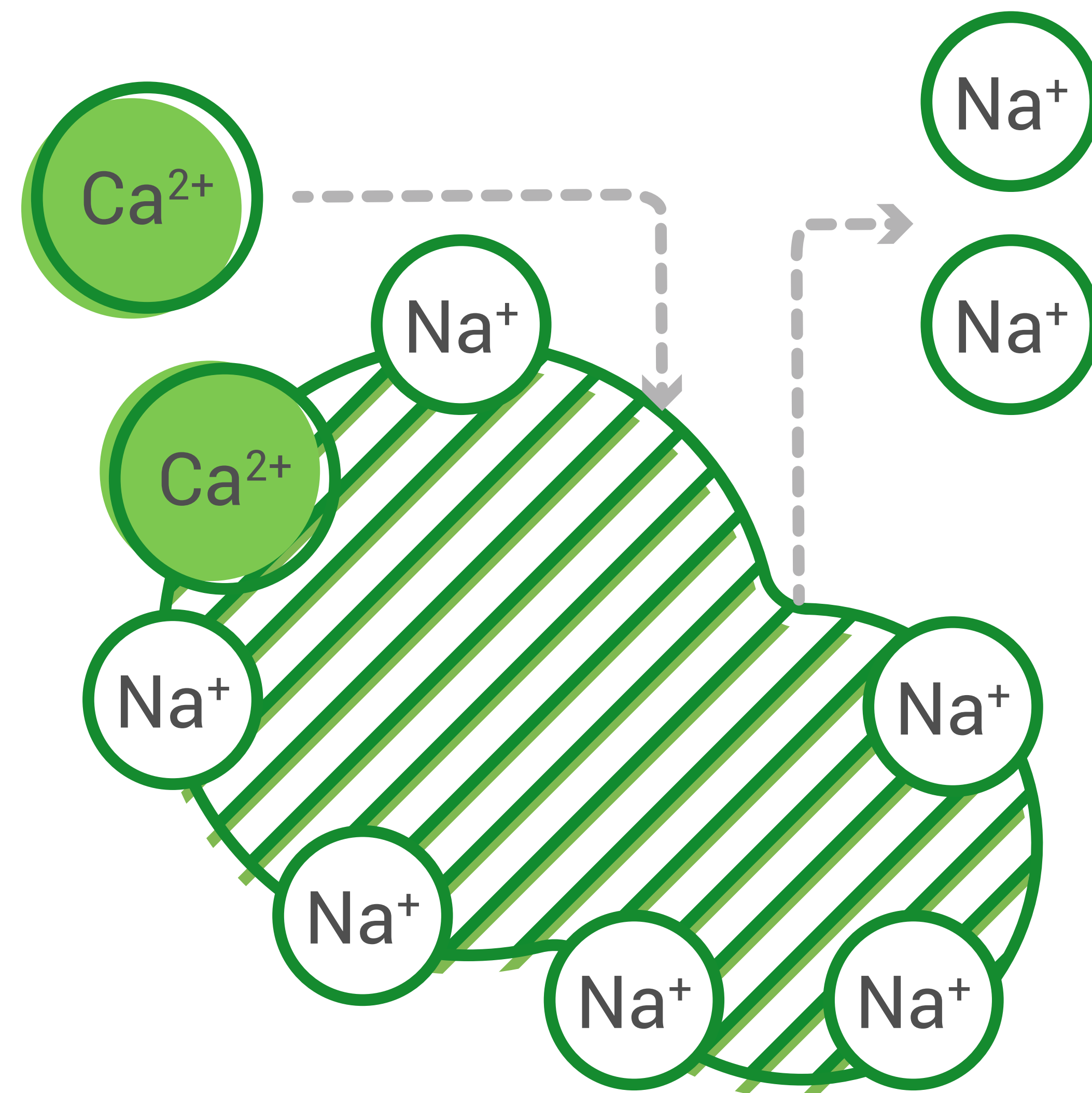
# MICROGLOBULES

long polymer chains, when connected together, form a mechanically strong structure with a large internal surface area

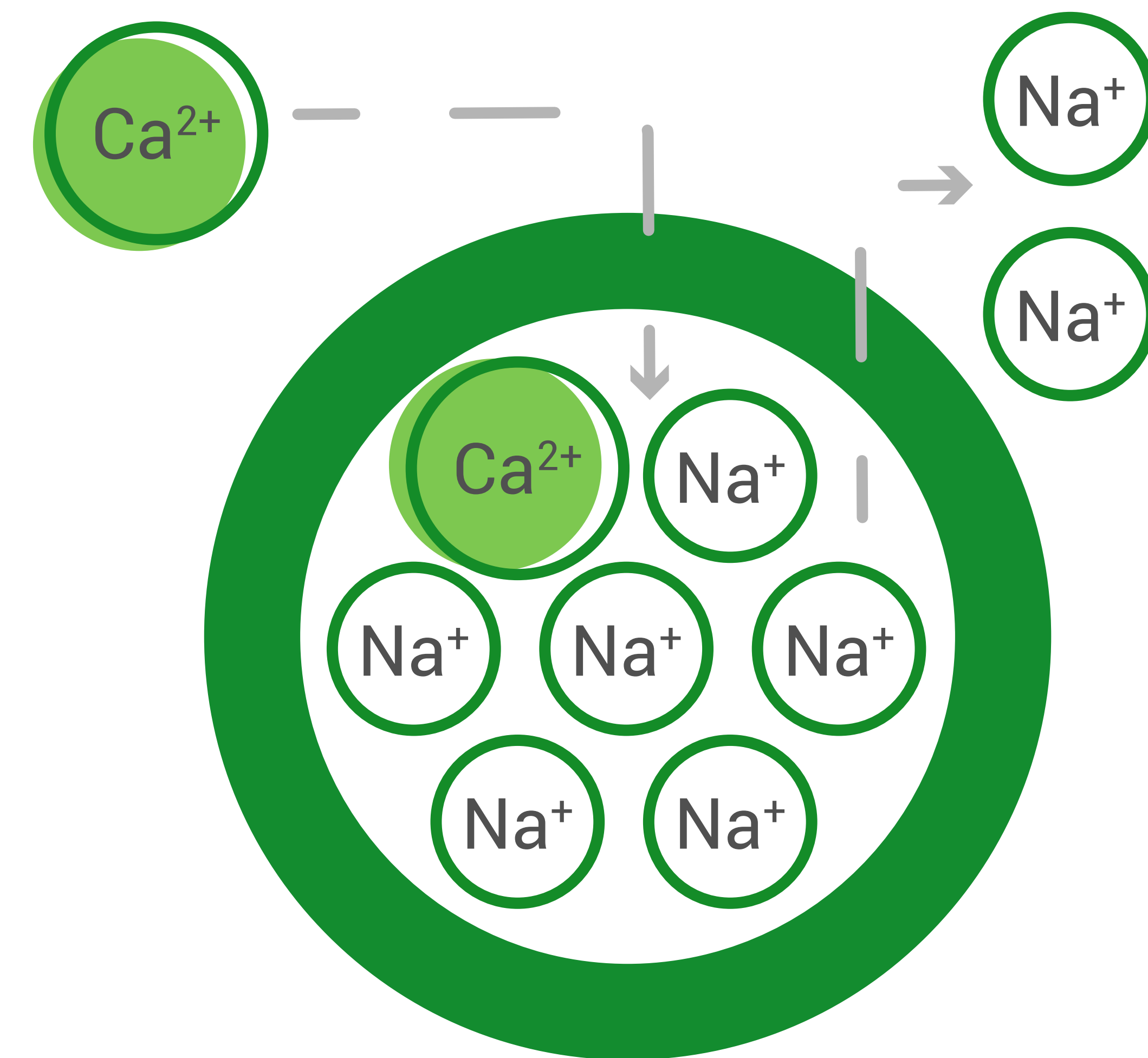
up to **= 20**  $\text{m}^2$  sorption surface



## ARAGON



## ION-EXCHANGE RESIN

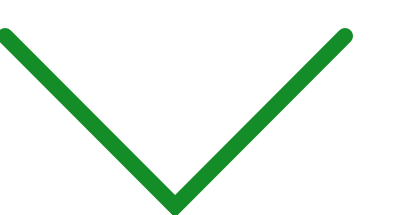


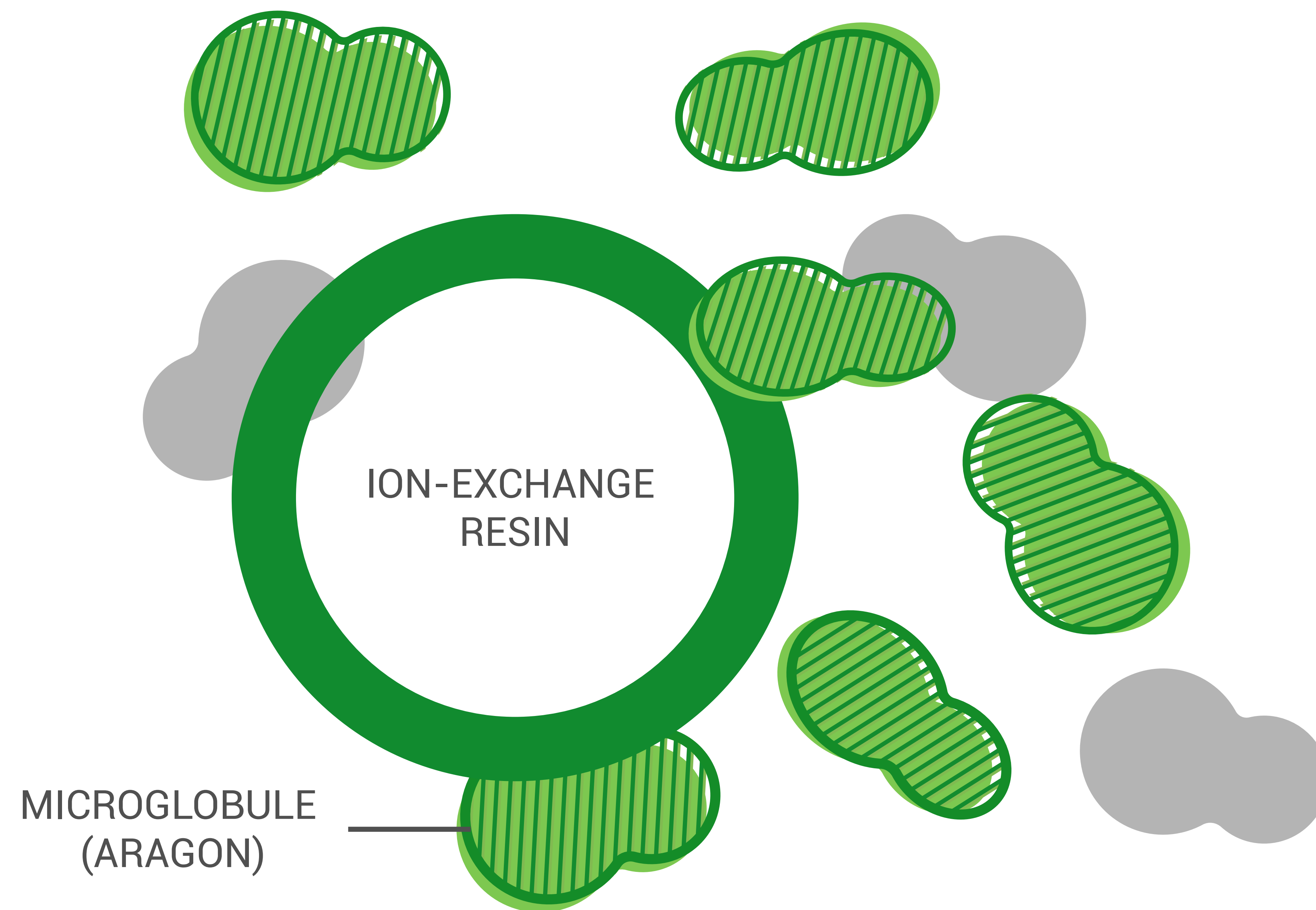
### ION EXCHANGE IN ARAGON

occurs on the globules' surface, which is much faster than in regular ion-exchange materials, because there is no diffusion through the grains' protective cover.

### SPEED OF ION EXCHANGE IN ARAGON

grows with the speed of the source water flow, because due to the fast replenishment of solution in micropores the ion exchange process becomes more efficient.





# ARAGON 2

Invention Patent:  
№ 57142

Aragon with the increased

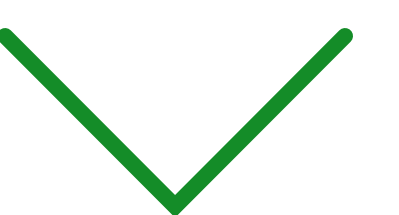
by **12-15** times

ion-exchange capacity.

In the process of synthesis the granules of ion-exchange resin are embedded in the polymer.

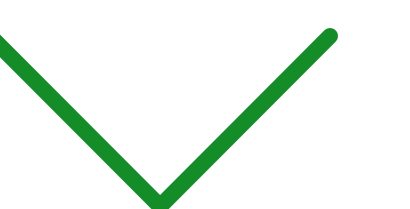
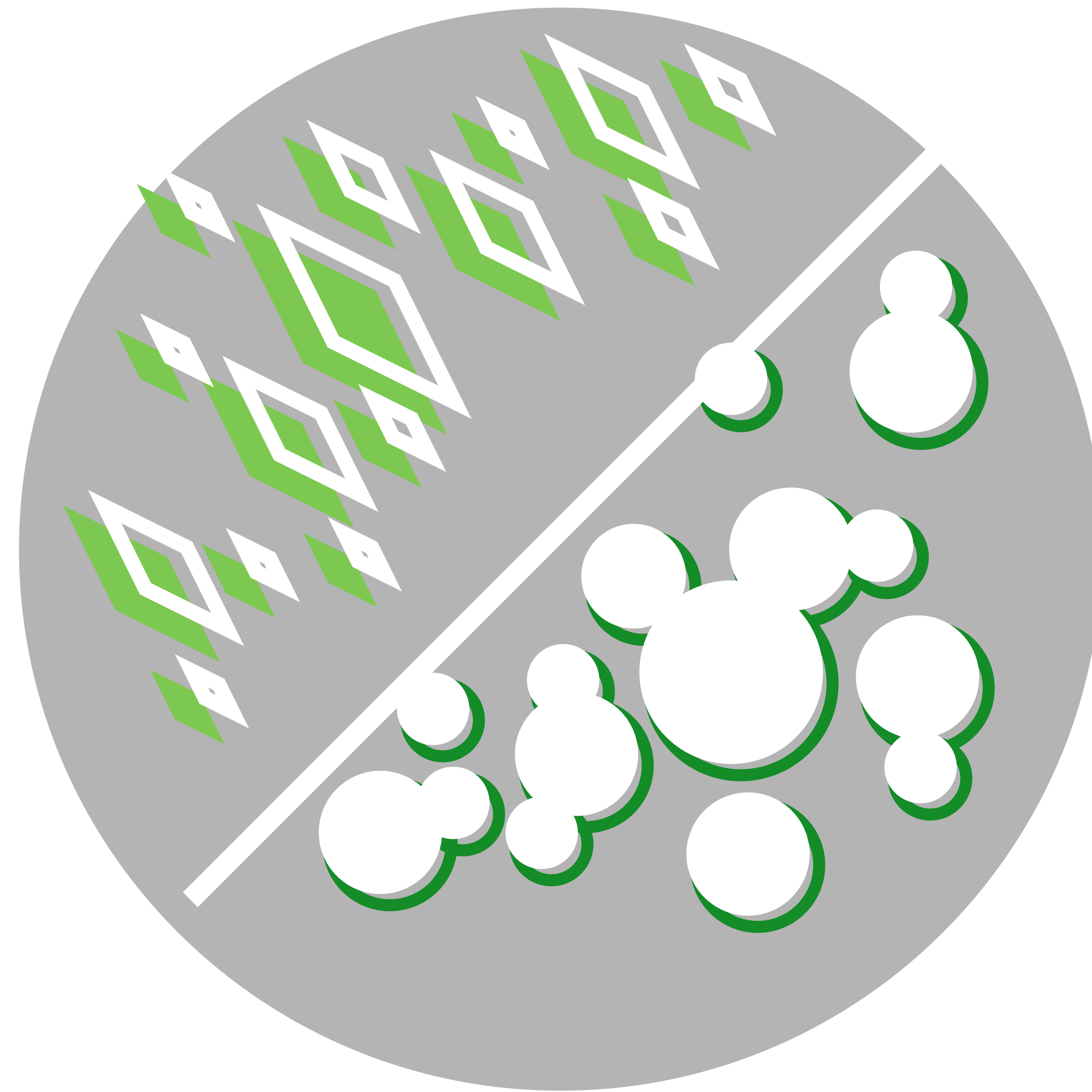
---

The resin's particles are held by mechanical and electrokinetic bonds.





# QUASI-SOFTENING

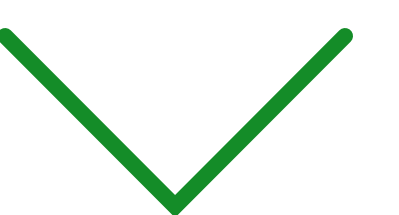


# QUASI-SOFTENING

Invention Patent:  
№ 2261843  
№ 2286953



As clusters move in channels between microglobules, the pressure increases and causes a shift of chemical balance resulting in dissolution of carbon dioxide contained in water. This is how conditions for clusters recrystallization from **CALCITE to ARAGONITE are created.**



## ARAGON FOR PREVENTION OF KIDNEY STONE DISEASE

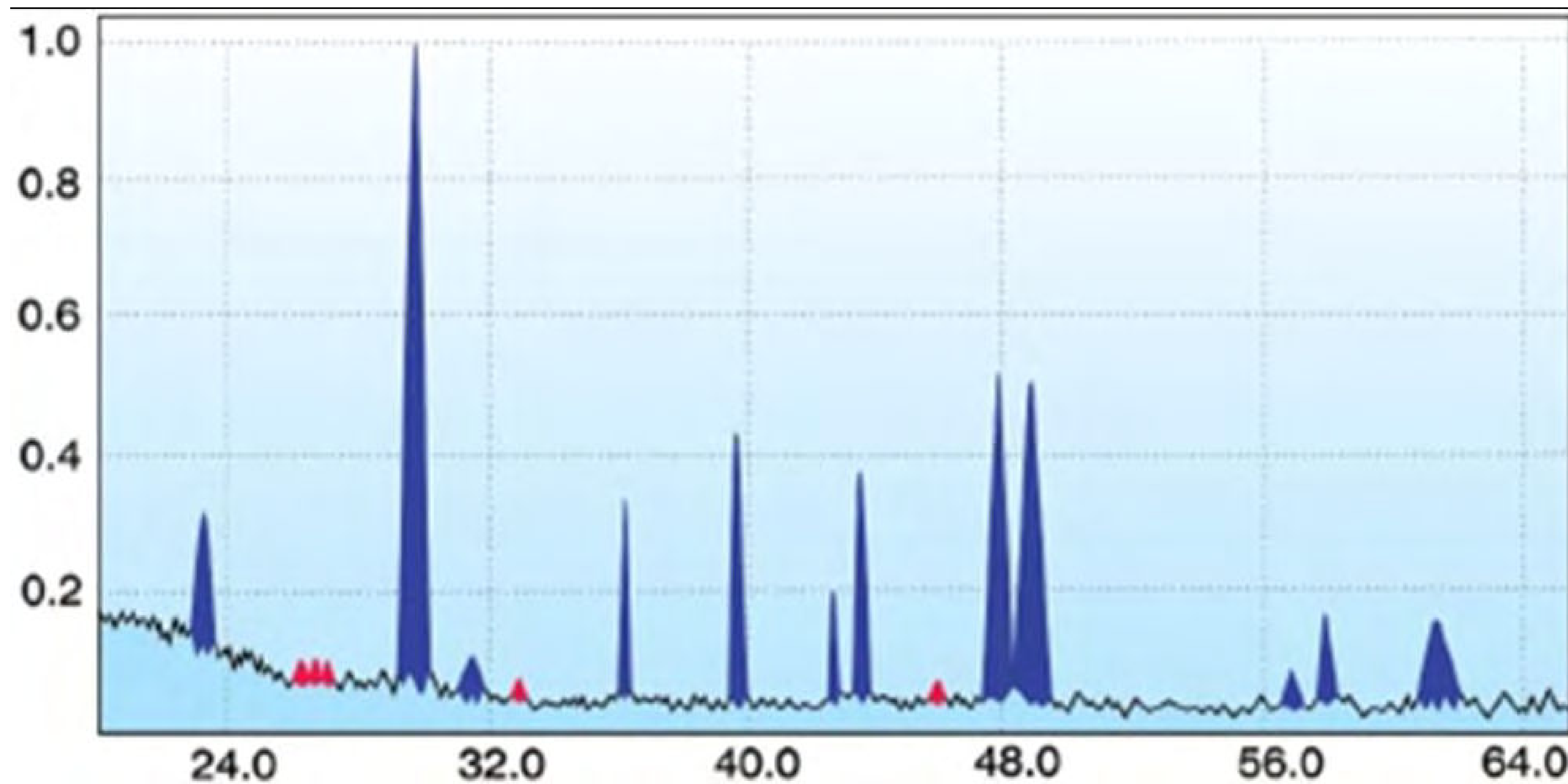
According to the results of the researches conducted at the Saint Petersburg Military Medical Academy, drinking of hard water filtered with ARAGON leads to reduction of crystals causing stone formation in size and quantity (2). Moreover, the aragonite form of hardness salts contributes to the better calcium absorption, thus facilitating kidneys' works



Kirov Military Medical Academy

# CHANGE OF COMPOSITION OF CARBONATES DISSOLVED IN WATER

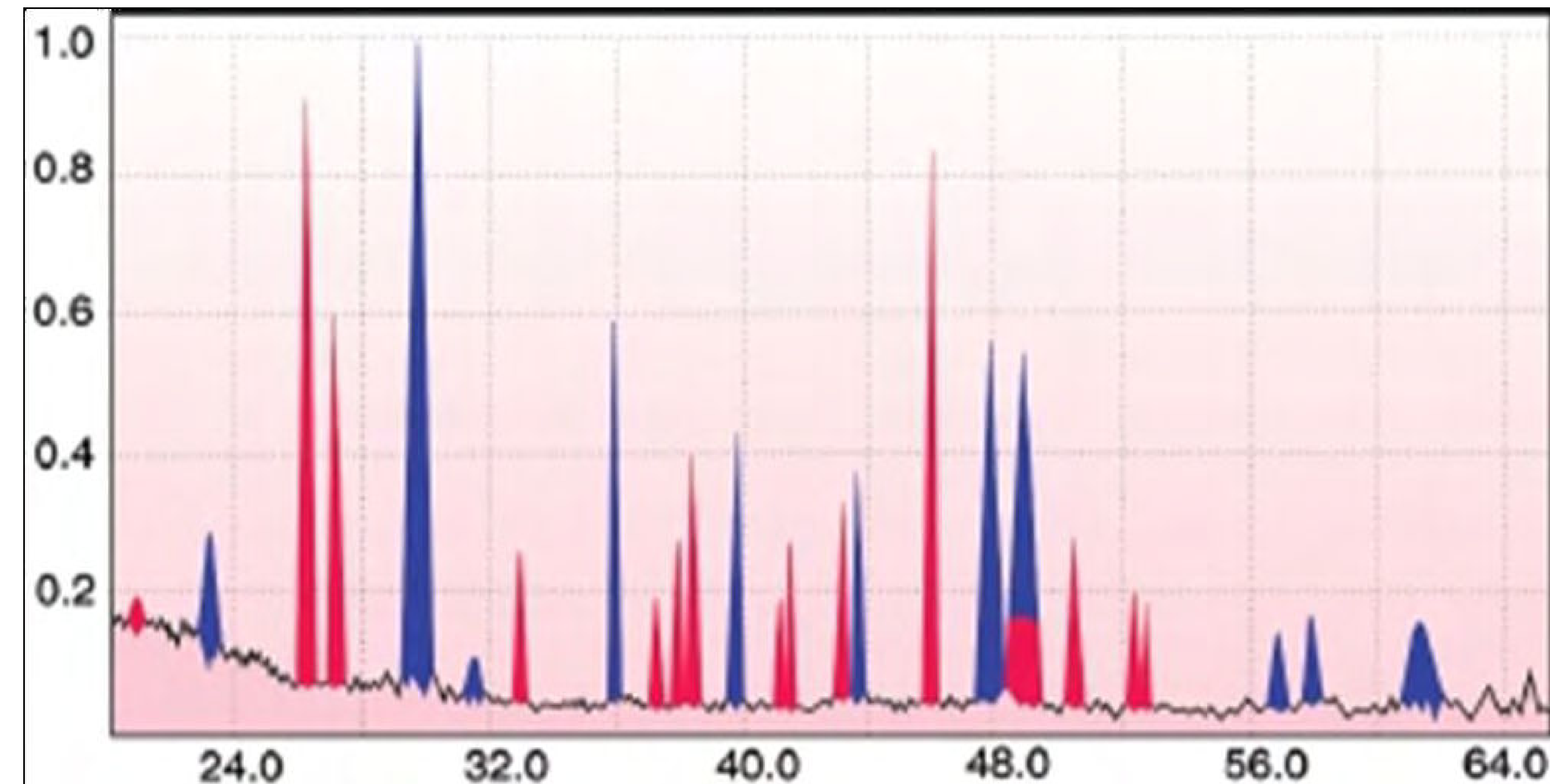
(X-RAY SPECTRAL  
ANALYSIS RESULTS)



Ordinary hard water:

**5%** ARAGONITE

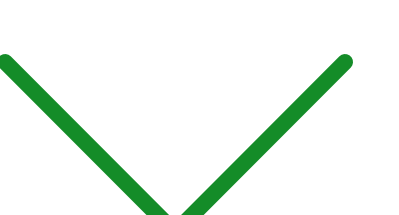
**95%** CALCITE



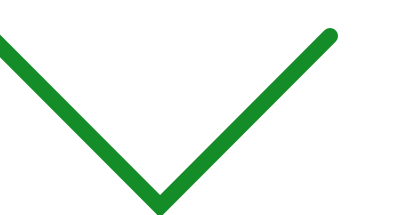
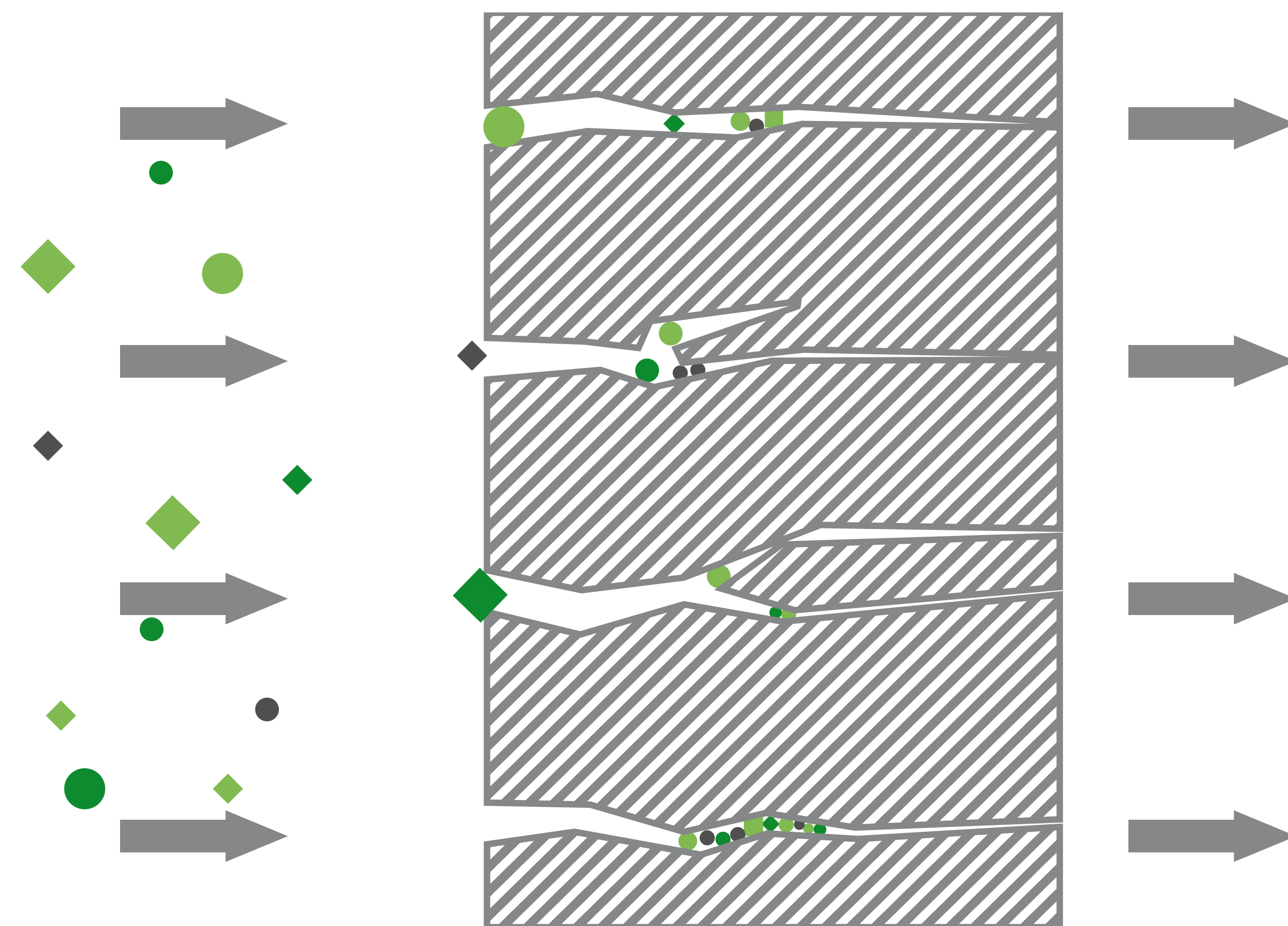
Filtered water:

**40%** ARAGONITE

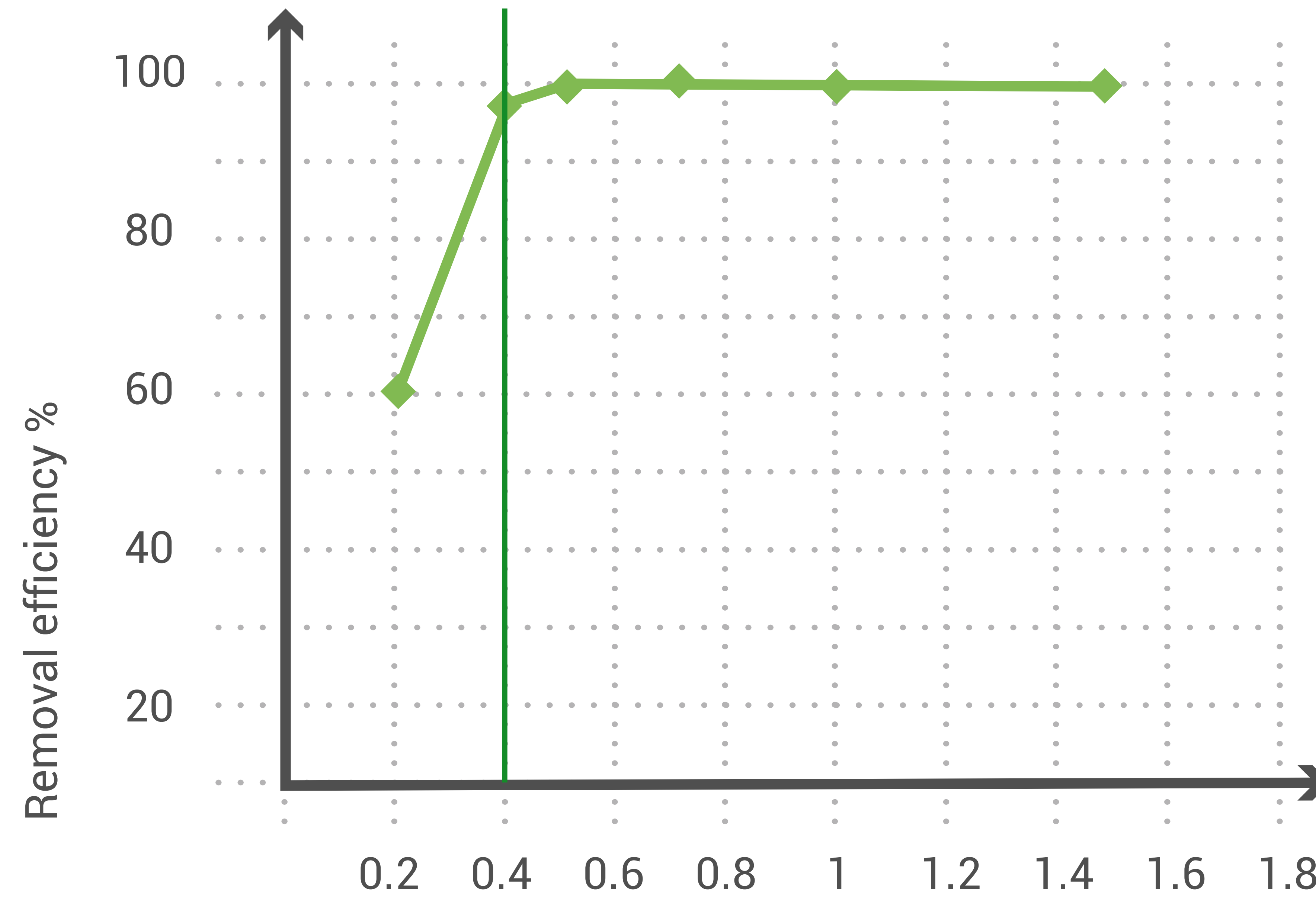
**60%** CALCITE



# MECHANICAL FILTRATION

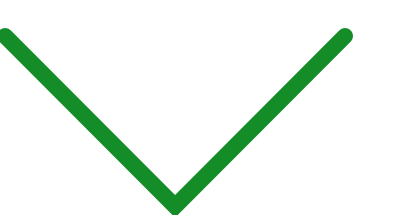


## SUSPENDED SOLIDS REMOVAL EFFICIENCY

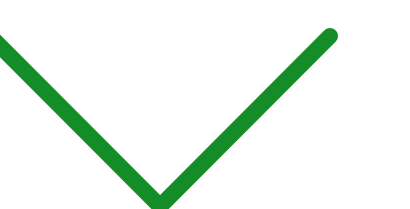
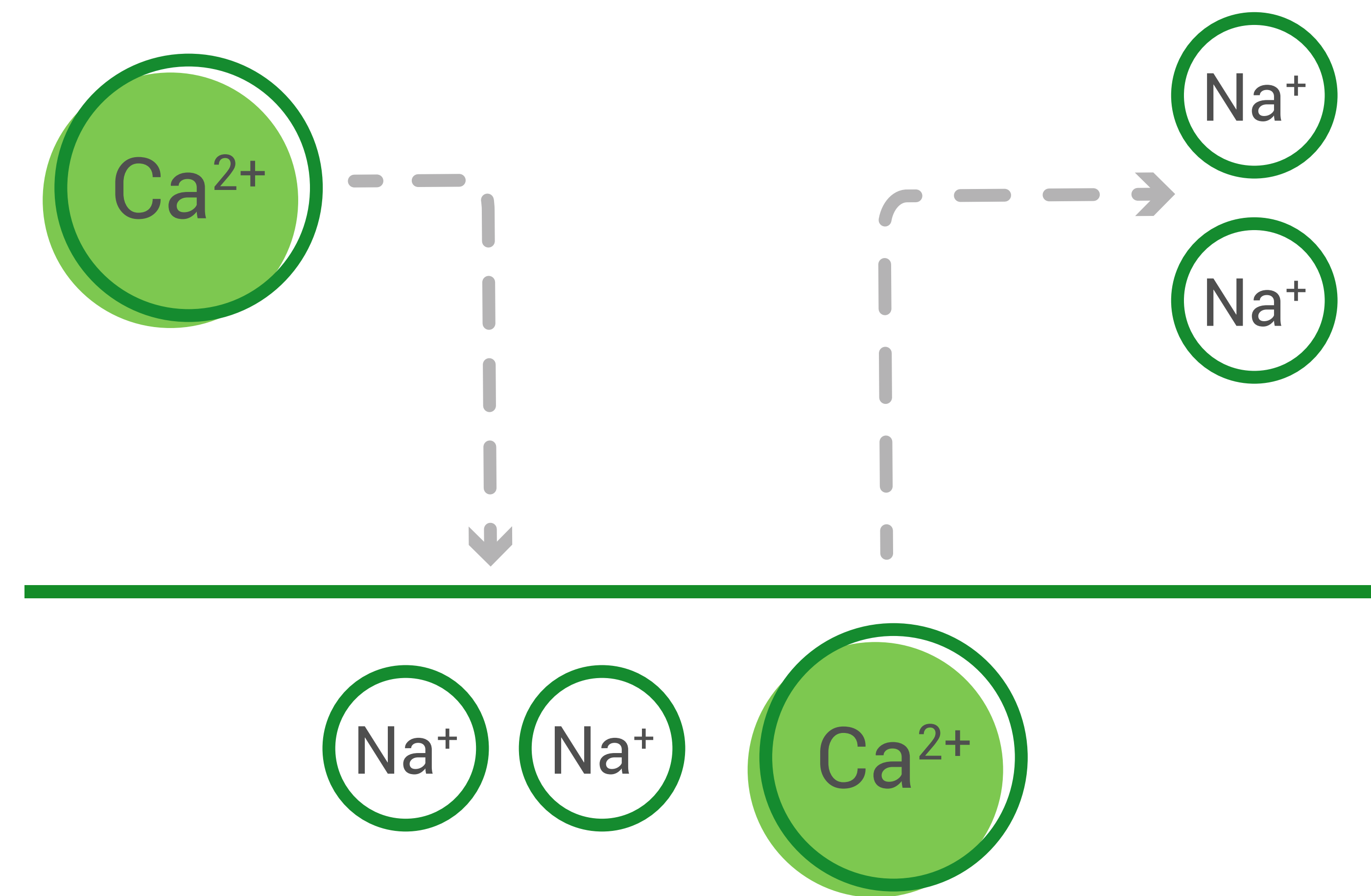


Size of removed particles, µm

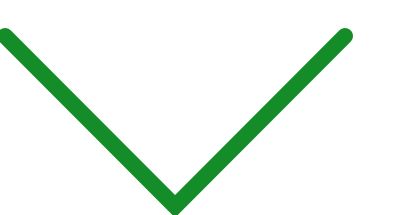
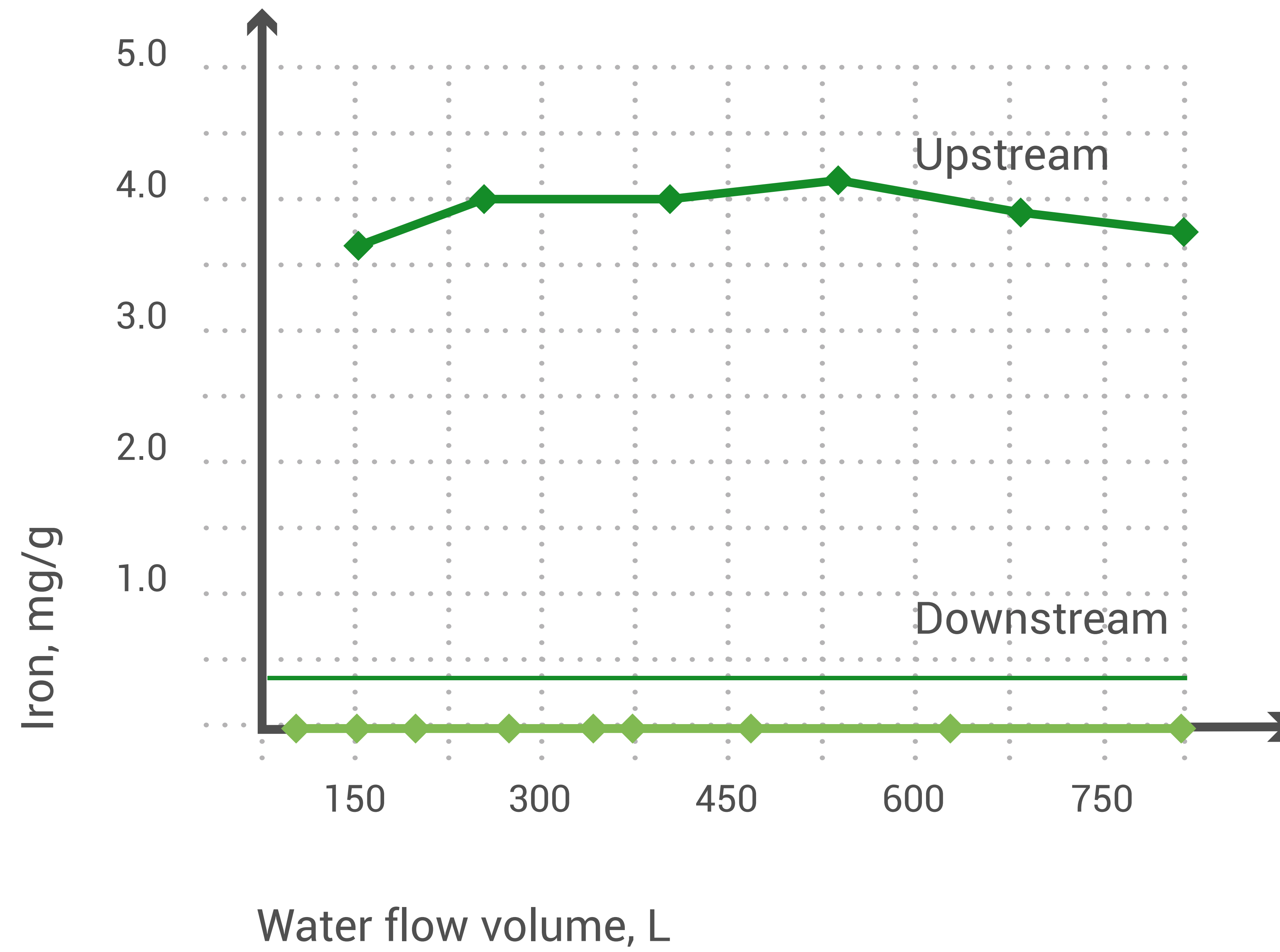
Effective removal of suspended solids  
of the target particles' size.



# ION EXCHANGE

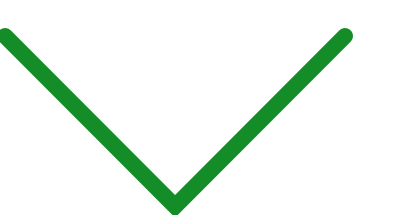
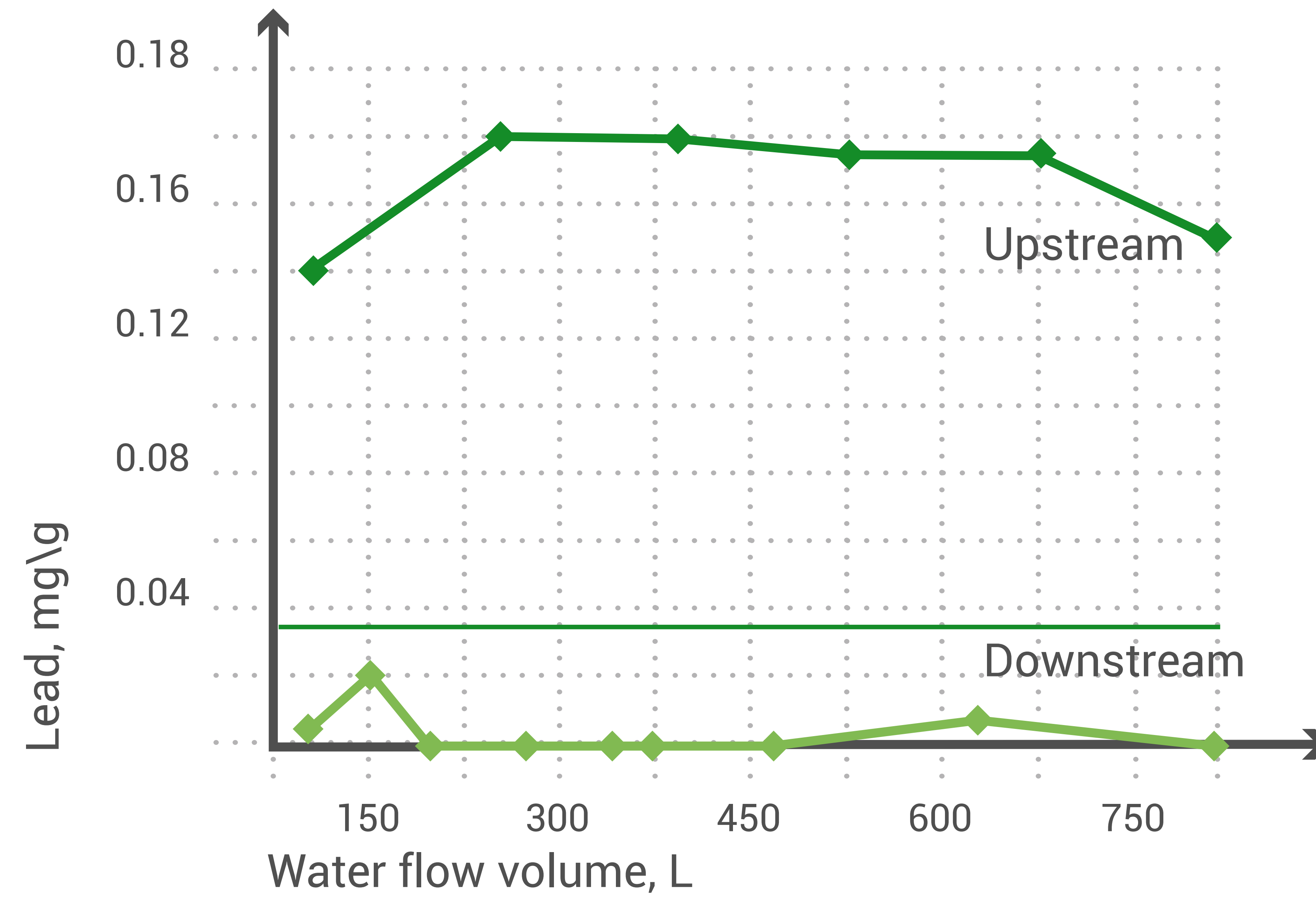


# IRON REMOVAL EFFICIENCY

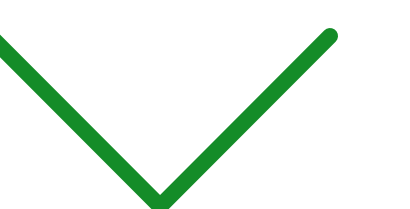
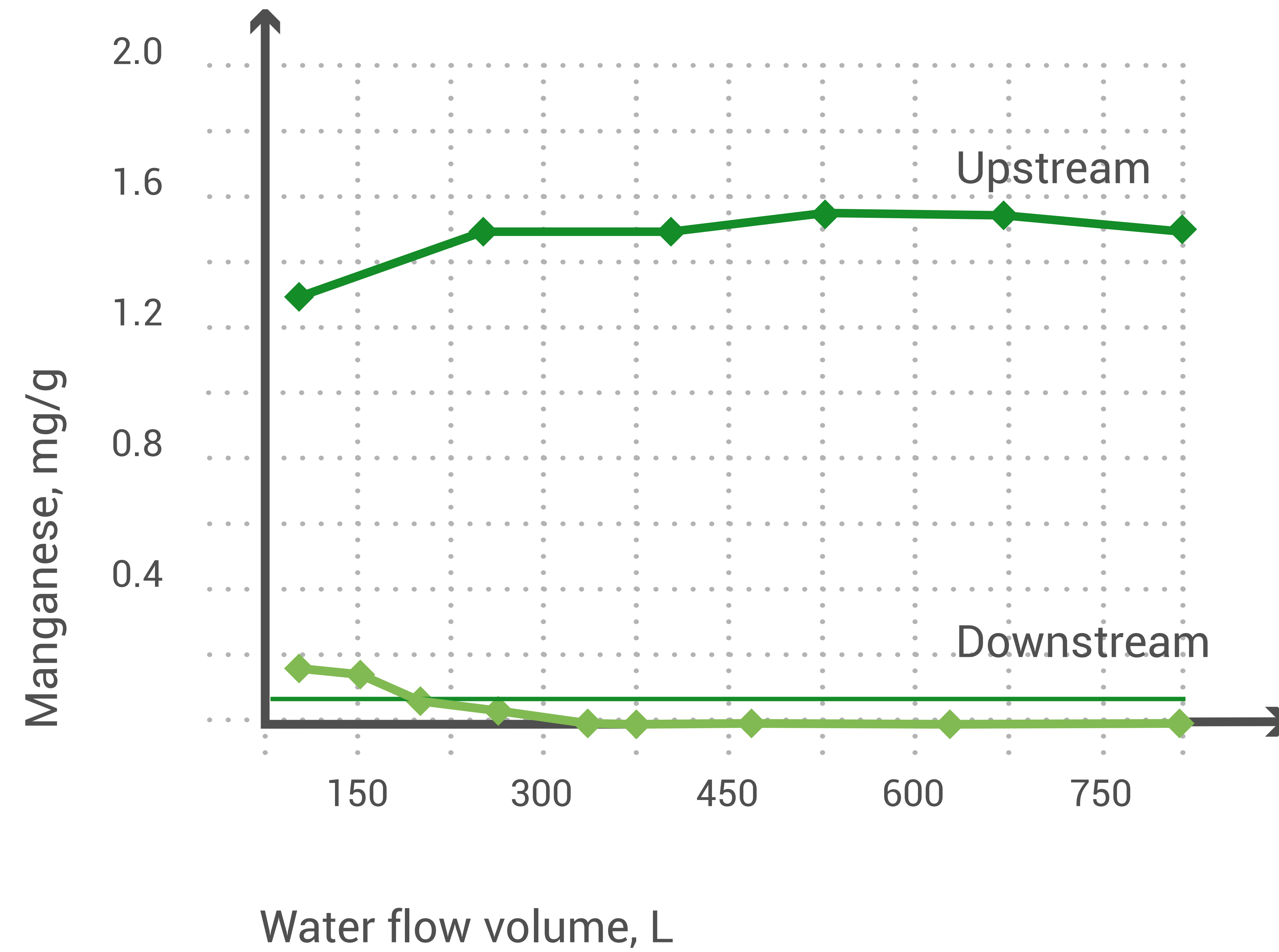




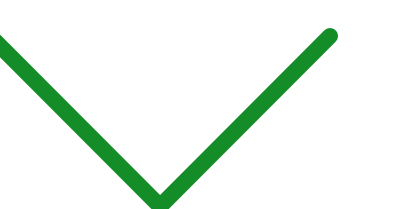
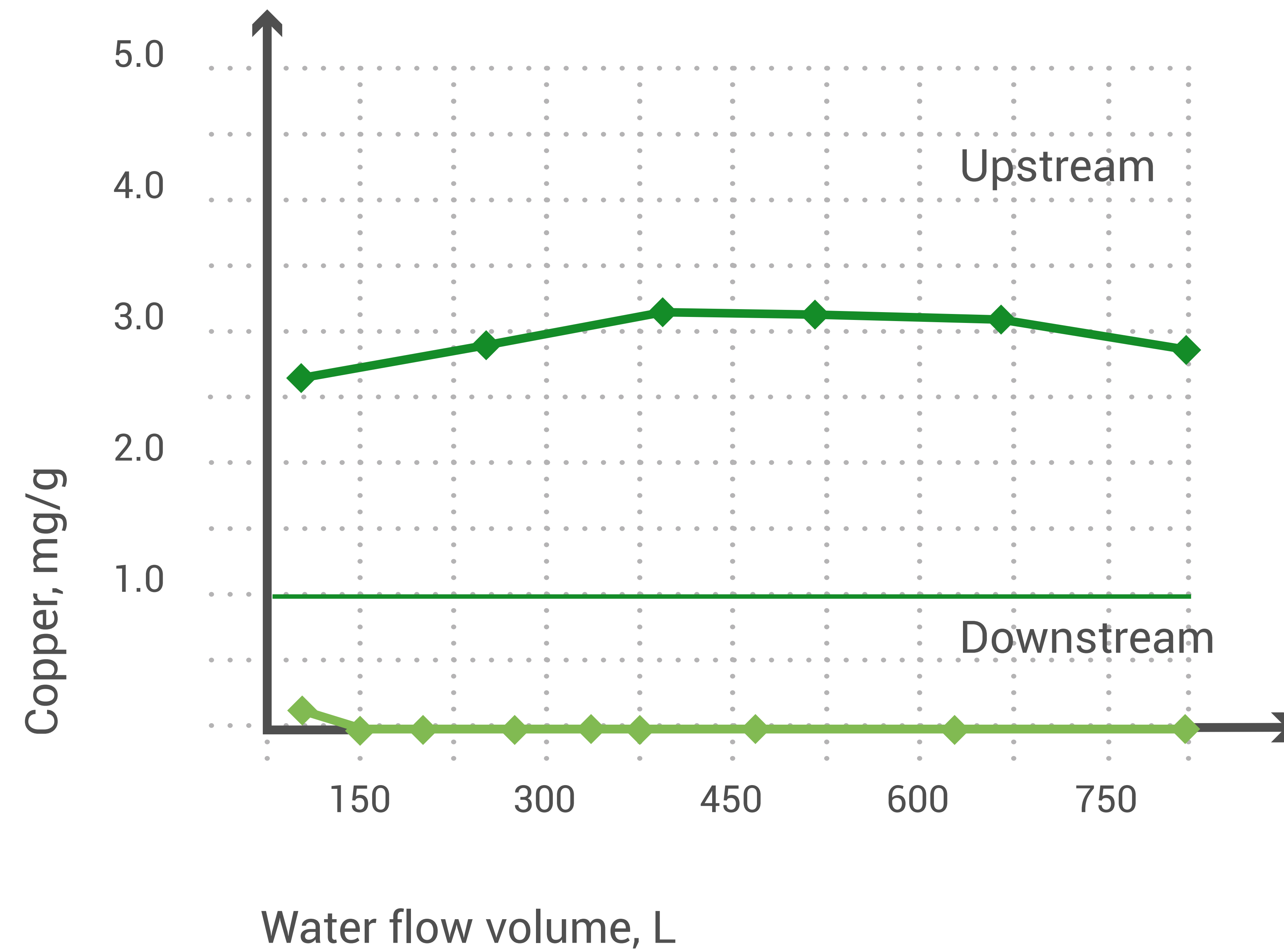
# LEAD REMOVAL EFFICIENCY



# MANGANESE REMOVAL EFFICIENCY

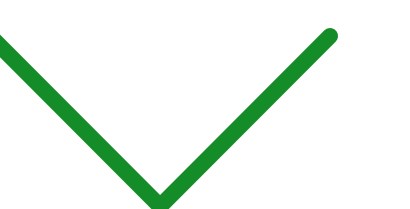
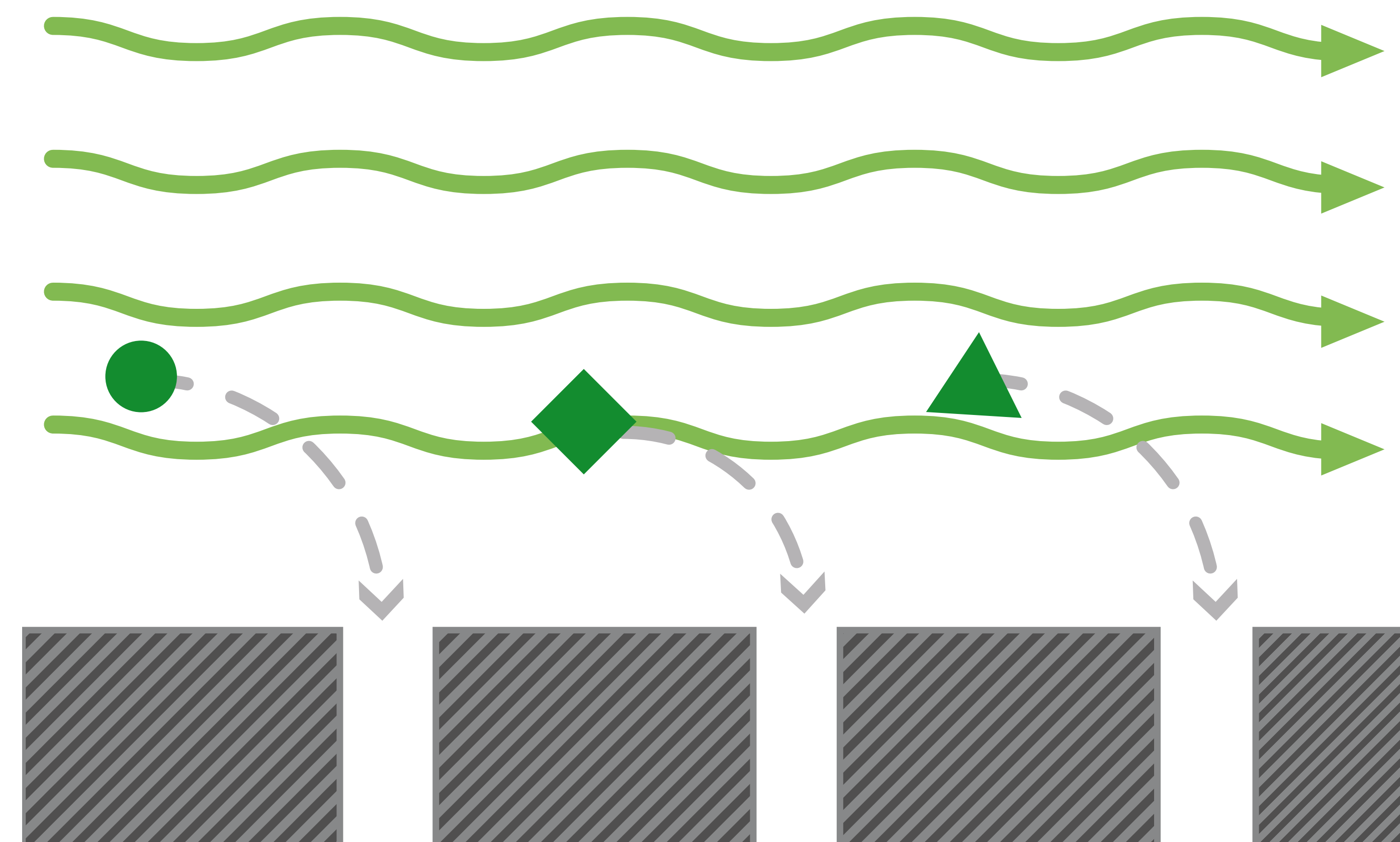


# COPPER REMOVAL EFFICIENCY

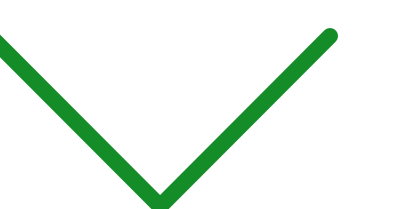
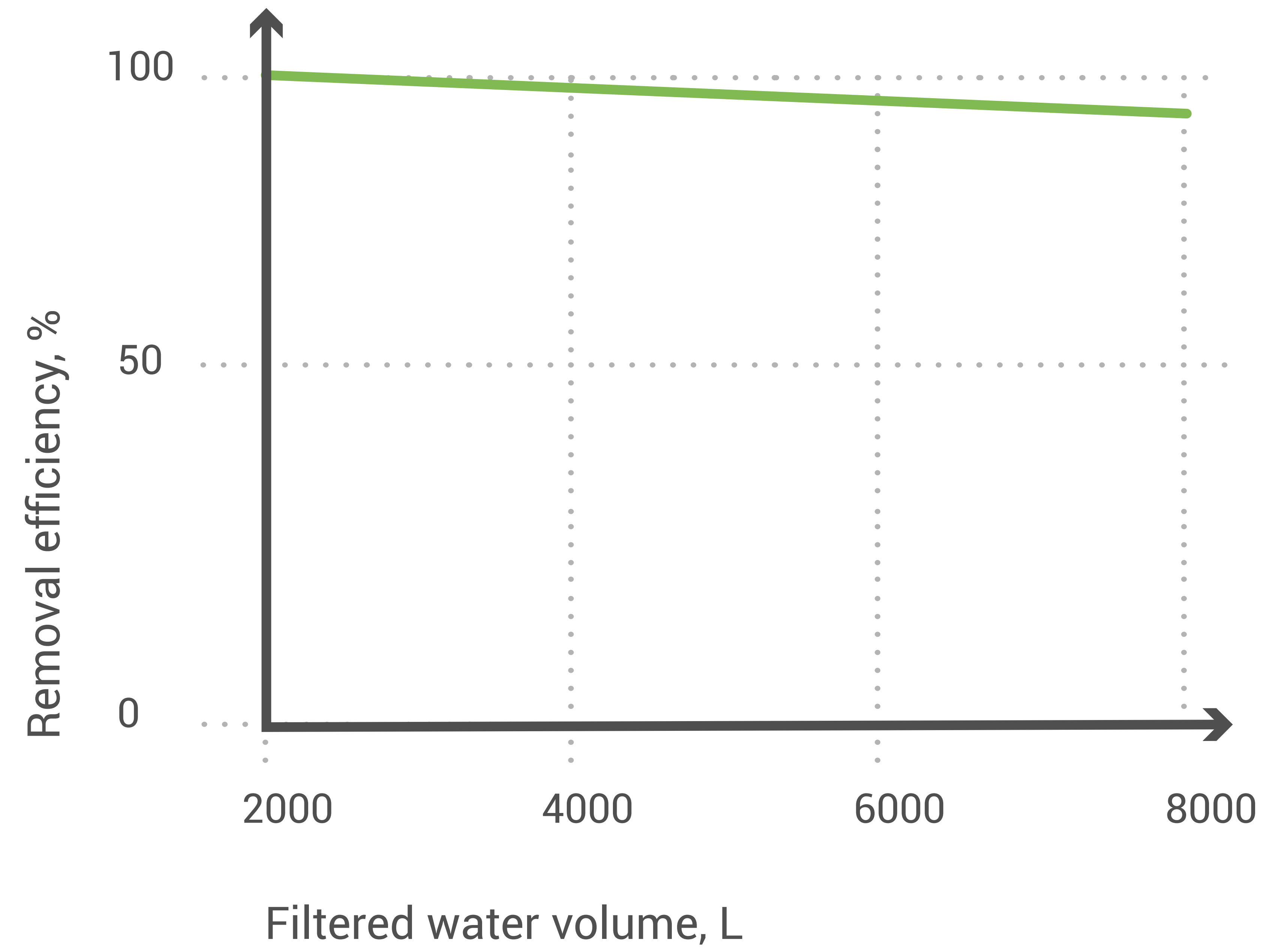


# SORPTION

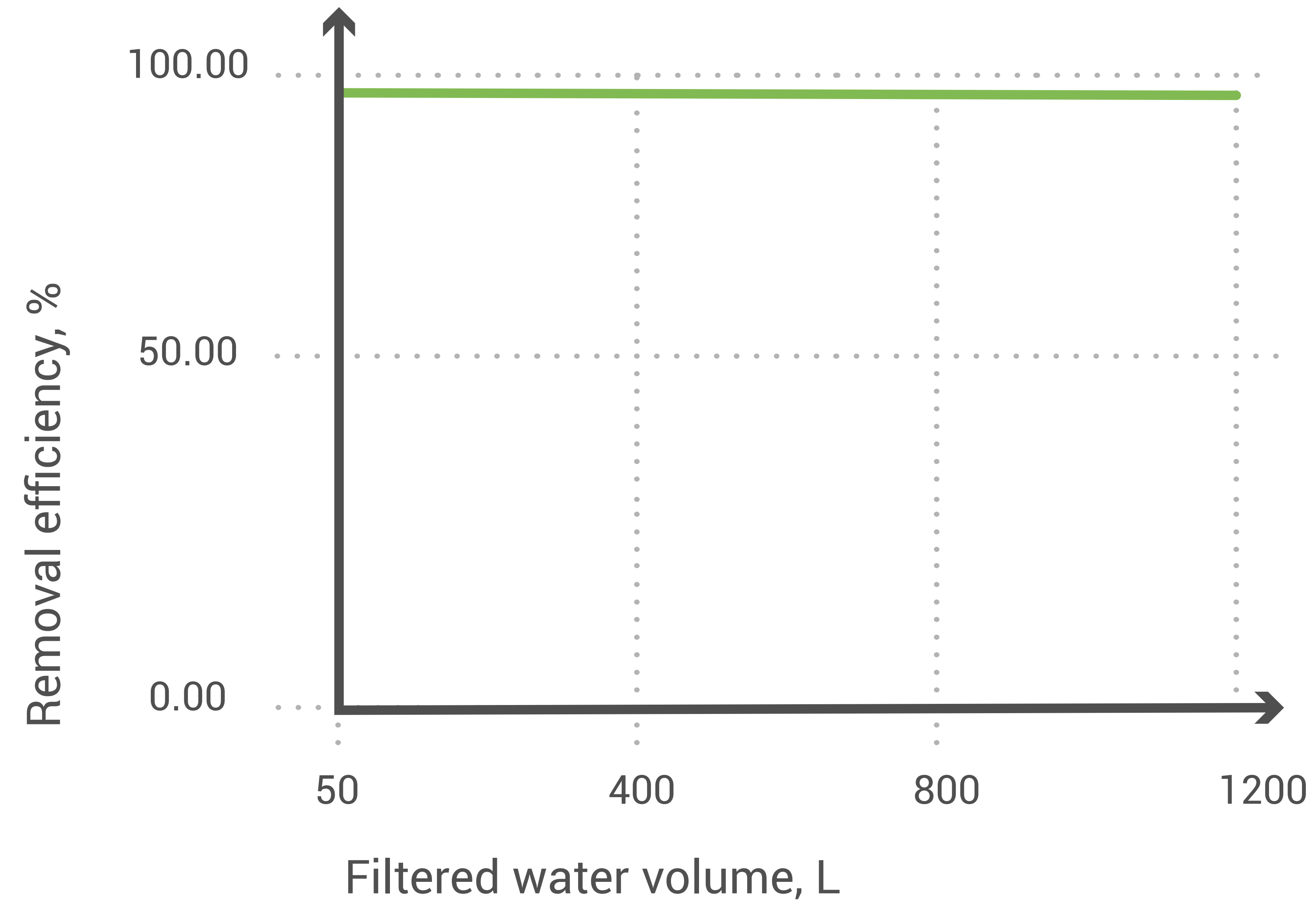
## SORPTION PROPERTIES OF ARAGON



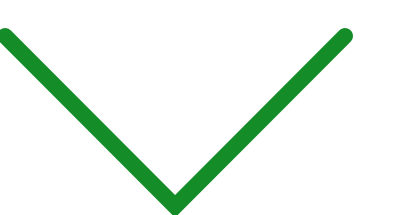
**FREE  
CHLORINE REMOVAL**



**PESTICIDES  
REMOVAL EFFICIENCY**  
(FOR SIMAZINE)

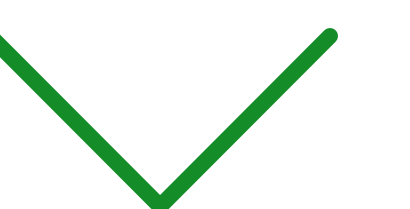
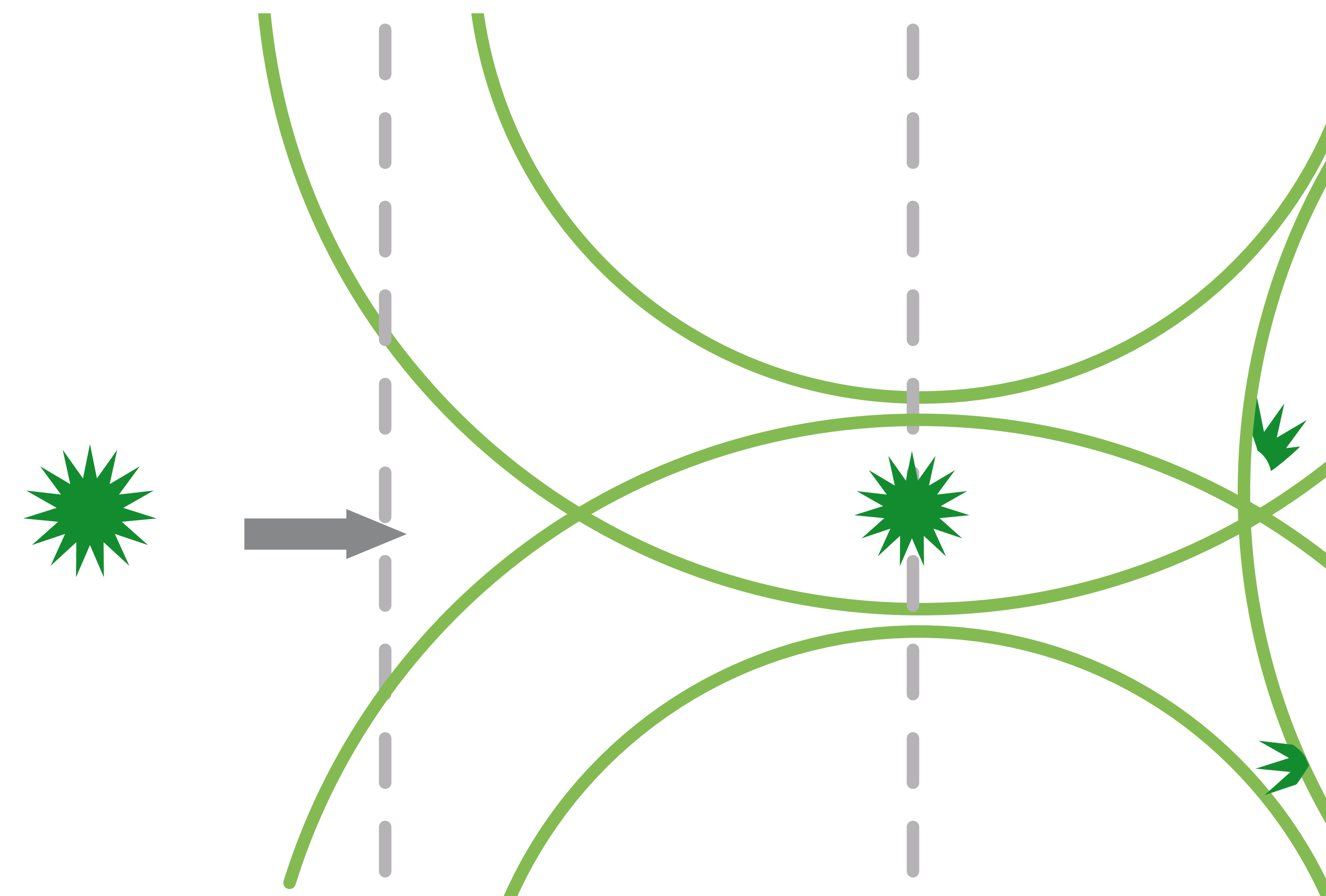


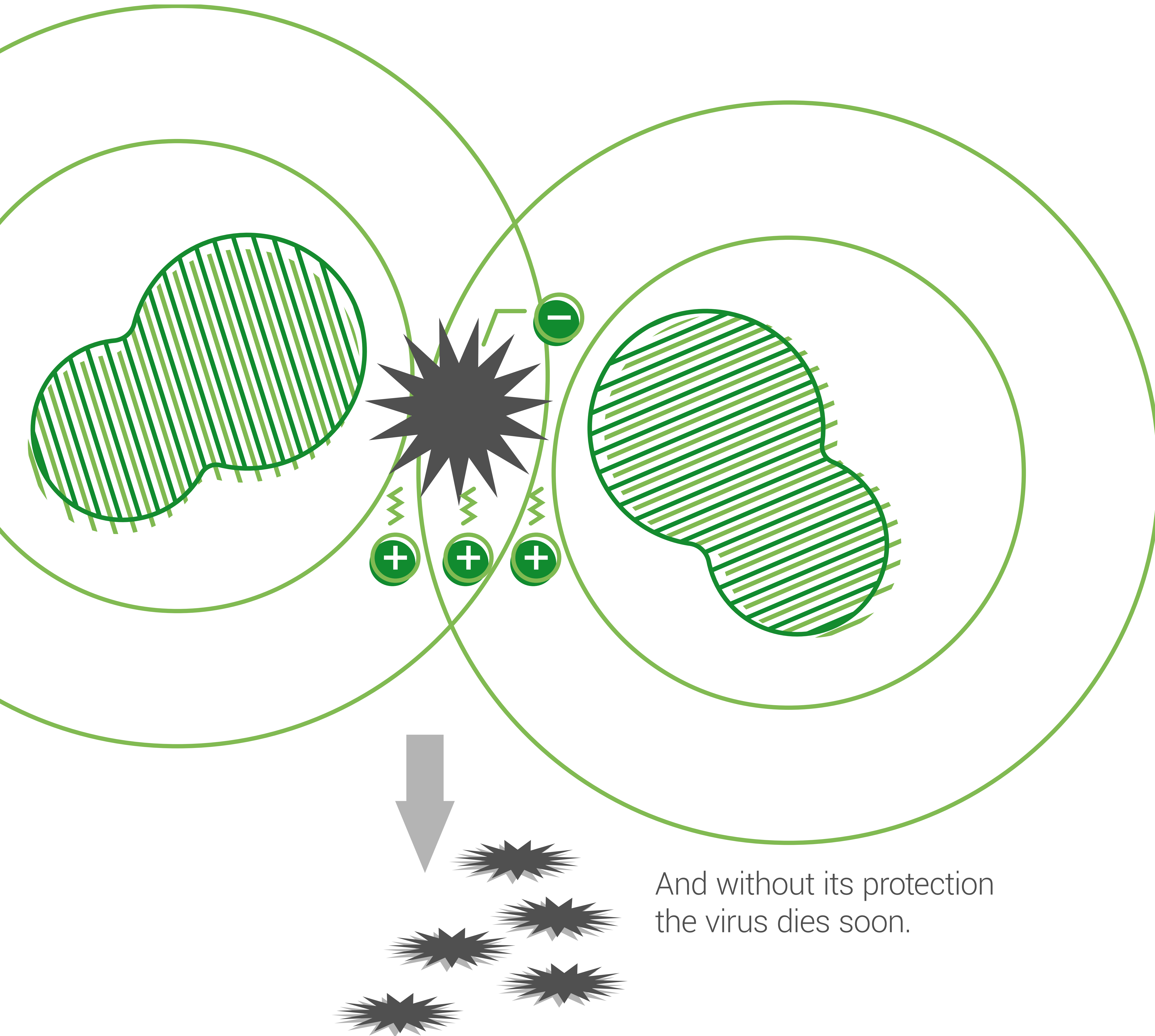
FILTERED WATER VOLUME, L	UPSTREAM CONCENTRATION, MG/L	DOWNSTREAM CONCENTRATION, MG/L	REMOVAL EFFICIENCY, %
50	1.1	0.01	97.62
400	1.0	0.015	98.50
800	1.2	0.02	98.33
1200	1.0	0.02	98.00



# DISINFECTION

REMOVAL OF VIRUSES AND BACTERIA

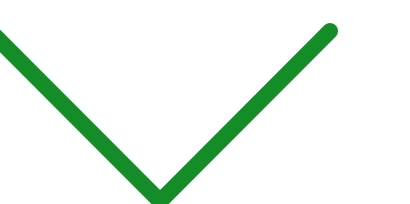




## ELECTROKINETIC IMPACT ON VIRUSES

Electric field causes destruction  
of the virus's protection cover.

And without its protection  
the virus dies soon.



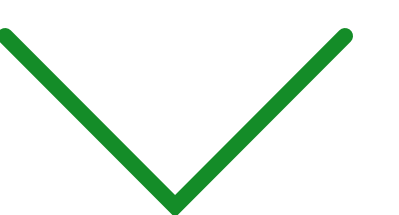




## INSTITUT PASTEUR DE LILLE (FRANCE)

The institute is named after the famous French microbiologist Louis Pasteur, its founder and the first director. For his prominent services to France Louis Pasteur was buried in Notre-Dame de Paris Cathedral, but later reburied on the territory of the Institute (Lille).

The important discoveries made in Pasteur Institute have contributed to the success of the fight against such virulent diseases as diphtheria, tetanus, tuberculosis, poliomyelitis, influenza, yellow fever and plague. The human immunodeficiency virus was discovered here in 1983. Since 1908 ten scientists of this institute have received Noble Prizes in Medical Science and Physiology.

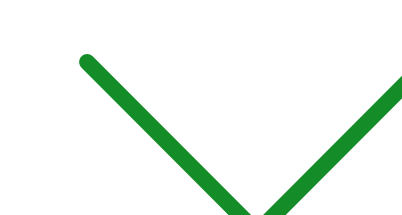


# VIRUSES CLASSIFICATION

VIRUS CLASS	SIZE (NM)	PERCENTAGE (%)	DISEASES
Hepatitis A	27 – 32	94,733	Hepatitis
Norovirus	27 - 40	99.994	Intestinal influenza and acute enteric infection
Rotavirus	60 - 70	99.998	Rotavirus infection
Enterovirus and astroviruses	27 - 30	99,993	Poliomyelitis, etc.
Adenoviruses	70 - 90	99,986	Catarrh of the upper respiratory tract , conjunctivitis, atypical pneumonia, etc.



Aragon passed laboratory testing in Russian and international testing institutions.



# THE PROPERTY OF ARAGON BIO TO CAPTURE VIRUSES AND BACTERIA WAS TESTED AND PROVEN



Pasteur Institute of Epidemiology  
and Microbiology,  
2007 – 2010



Kirov Military Medical  
Academy,  
2008



A.N. Sysin research institute of human ecology  
and environment hygiene,  
2011



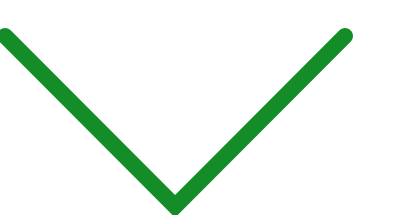
Influenza Research Institute,  
2011



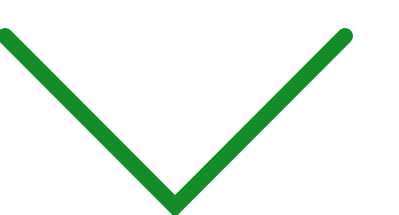
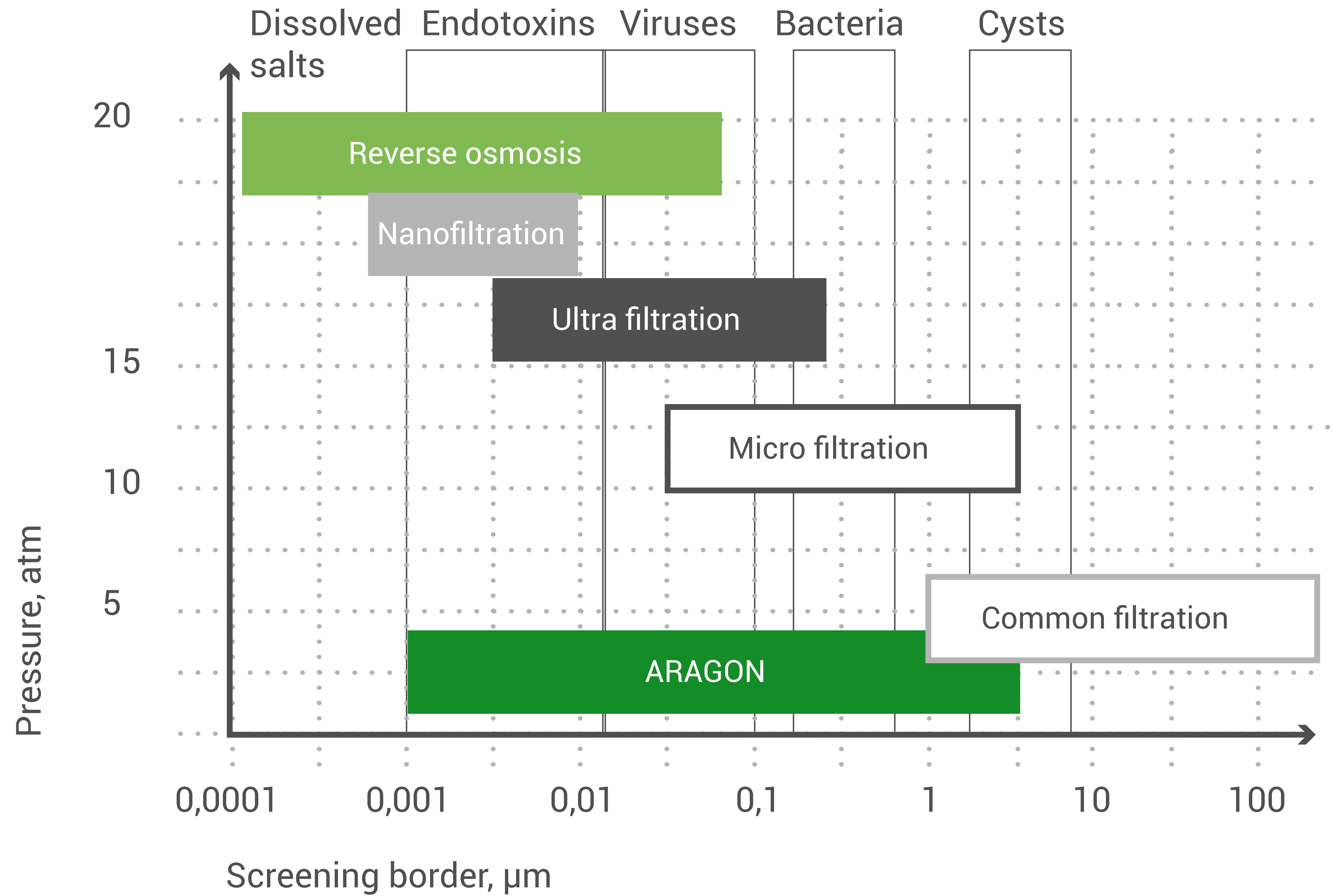
Università di Ferrara,  
2012



Institut Pasteur de Lille,  
2014



**COMPARISON  
OF WATER  
PURIFICATION  
TECHNOLOGY**



# ADVANTAGES



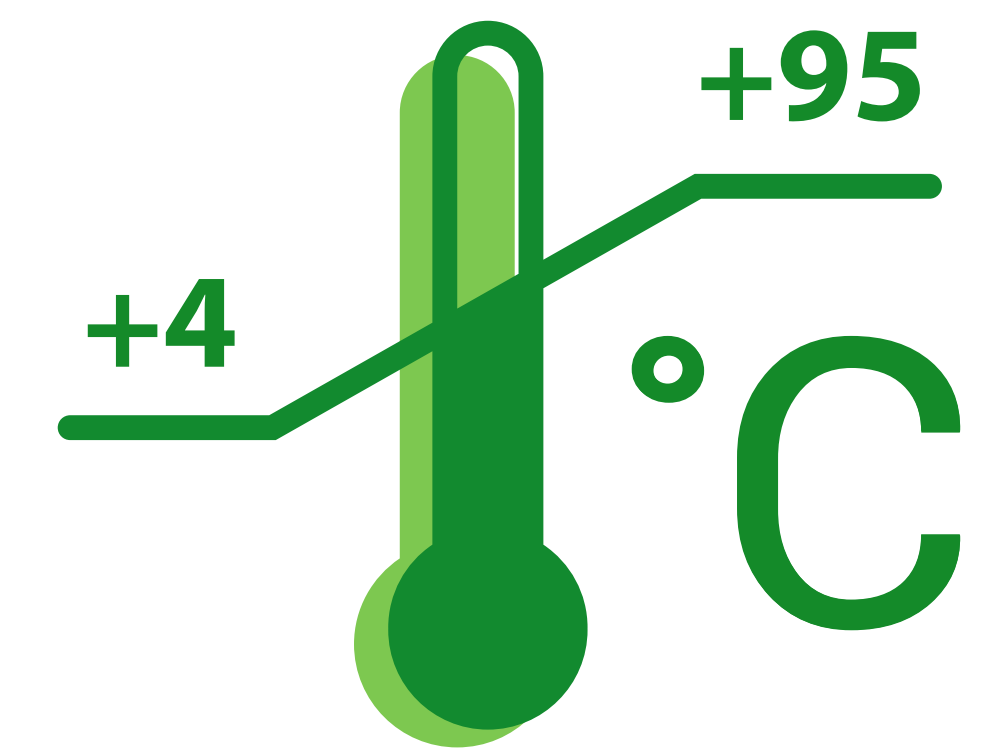
ANTI-DISCHARGE



SELF-INDICATION



ACTIVE SILVER



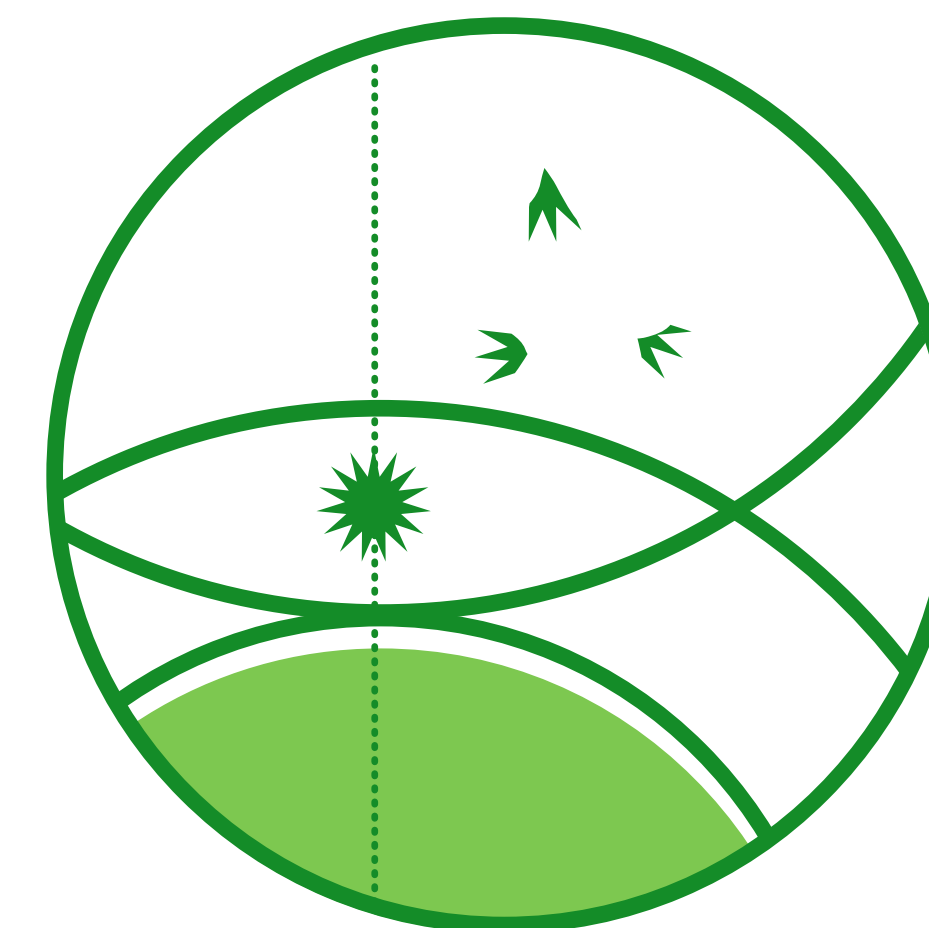
HOT AND COLD  
WATER TREATMENT



4 IN 1



QUASI-SOFTENING



REMOVAL OF BACTERIA  
AND VIRUSES



REGENERATION

