

Natural coagulants for specific wastewater treatment.

Pilot plant implementation

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Background

- Emerging water treatment technologies are needed for specific wastewater effluents in developing countries and small communities.
- Natural coagulants derived from tannins are right now a potential and well known option because these products are easy for unskilled personnel to handle and maintain.
- Tanfloc is a trademark of TANAC company (Brazil), a coagulant derived from *Acacia mearnsii* de Wild. Since its performance is feasible in a wide range of operational conditions, it can be used in a large variety of circumstances.

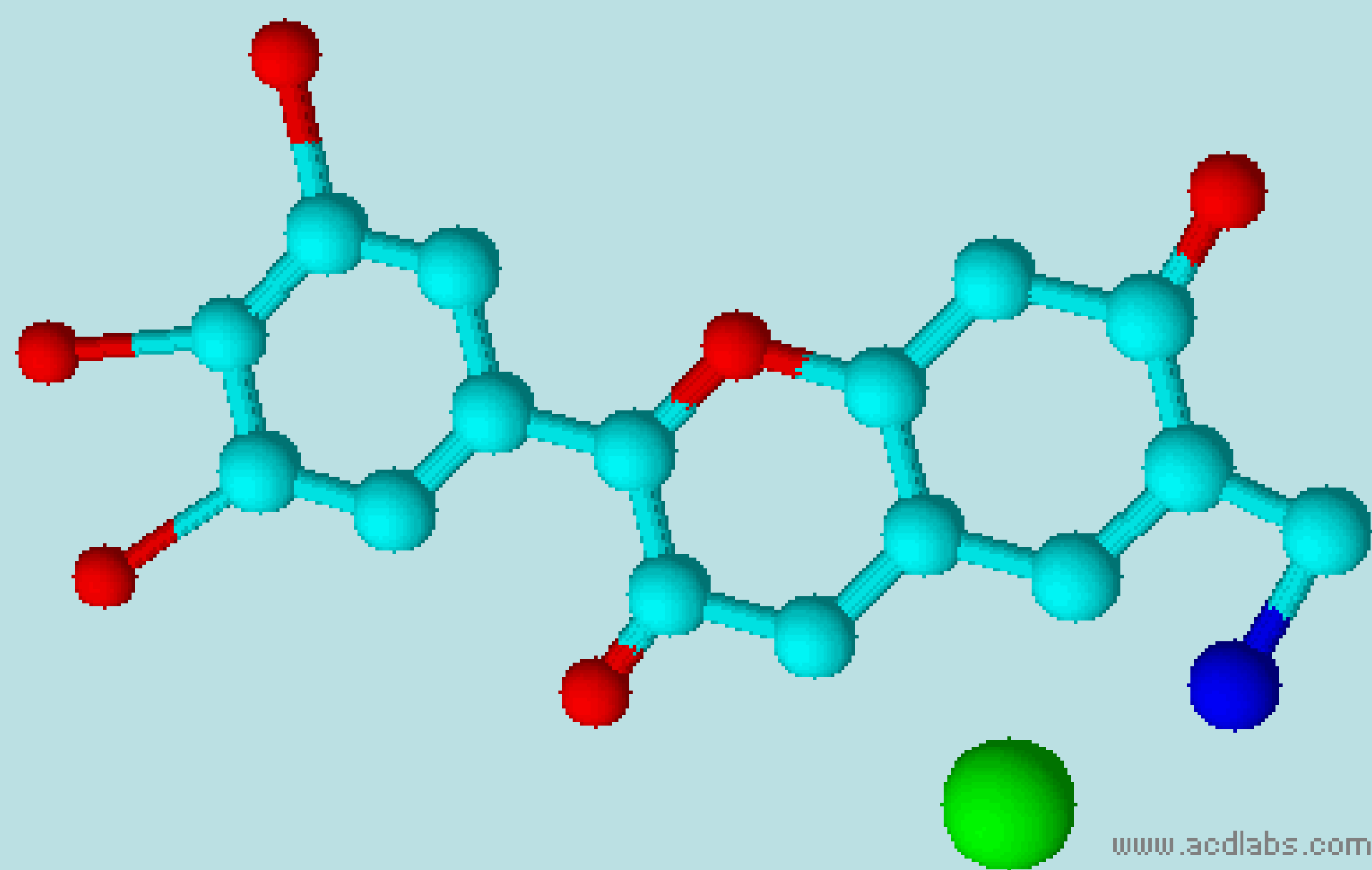


Figure 2. Probable structure of Tanfloc

Table 1. Experimental conditions in pilot plant trials

| Parameter | Value |
|------------------------------|---------------------------|
| Experimental temperature | 20°C |
| Experimental pH | 7 |
| Coagulant dosage | 92.2 mg·L ⁻¹ |
| Residence time in slow mixer | 20 min |
| Residence time in sedimenter | 60 min |
| Raw water flow | 77.1 mL·min ⁻¹ |

The idea

- Natural coagulants can be obtained through polymerization of tannin extracts.
- These chemicals are widely available in the bark of trees such as *Pinus pinaster*, *Schinopsis balansae* or *Acacia mearnsii* de Wild.



The investigation

We have developed a investigation with simulated wastewater (**Alizarin Violet 3R** as dye and **Sodium Dodecylbenzene** as surfactant). These effluents have been treated in a lab-scale pilot plant (figure 1).

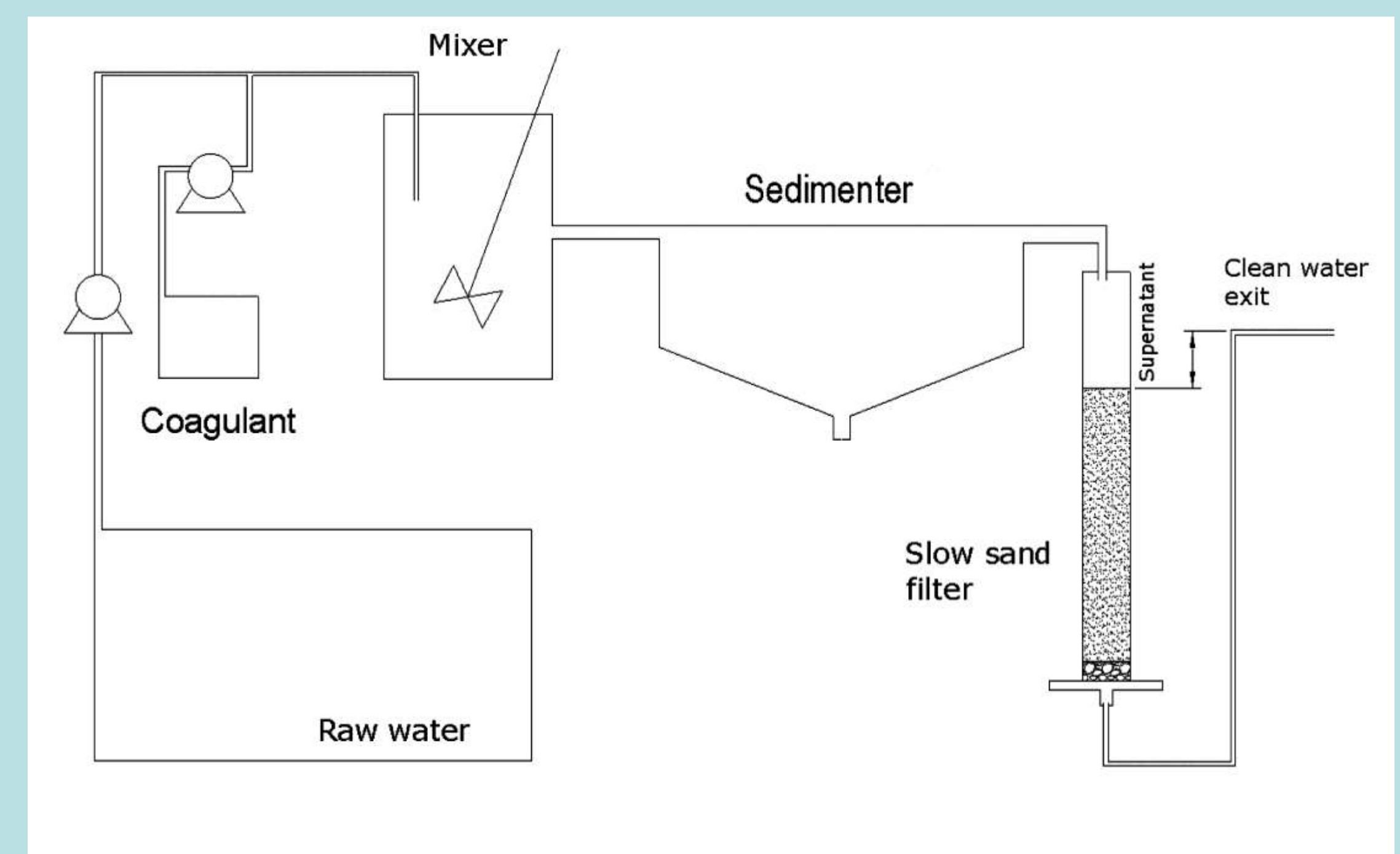


Figure 1. Pilot plant installation

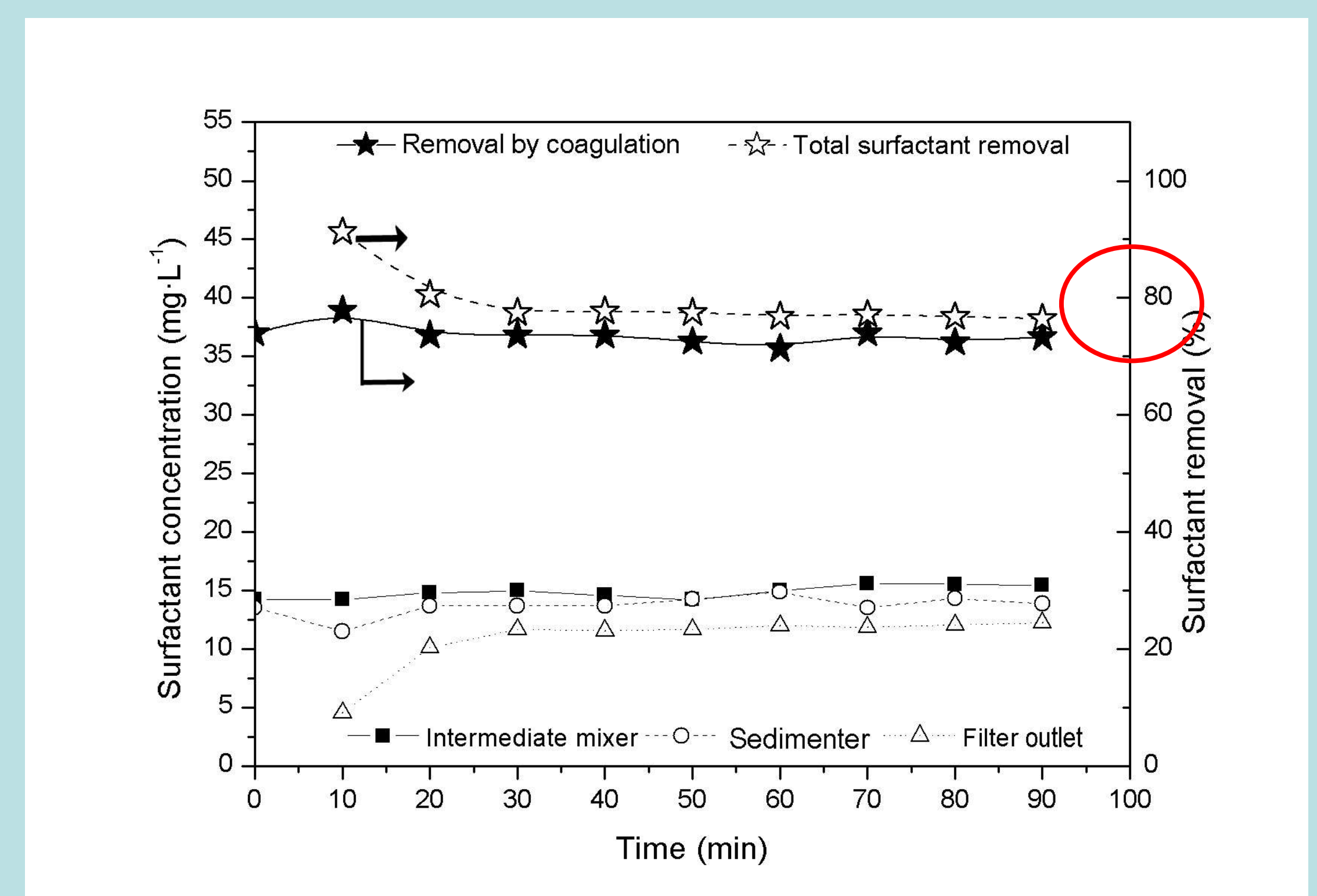


Figure 4. Surfactant removal

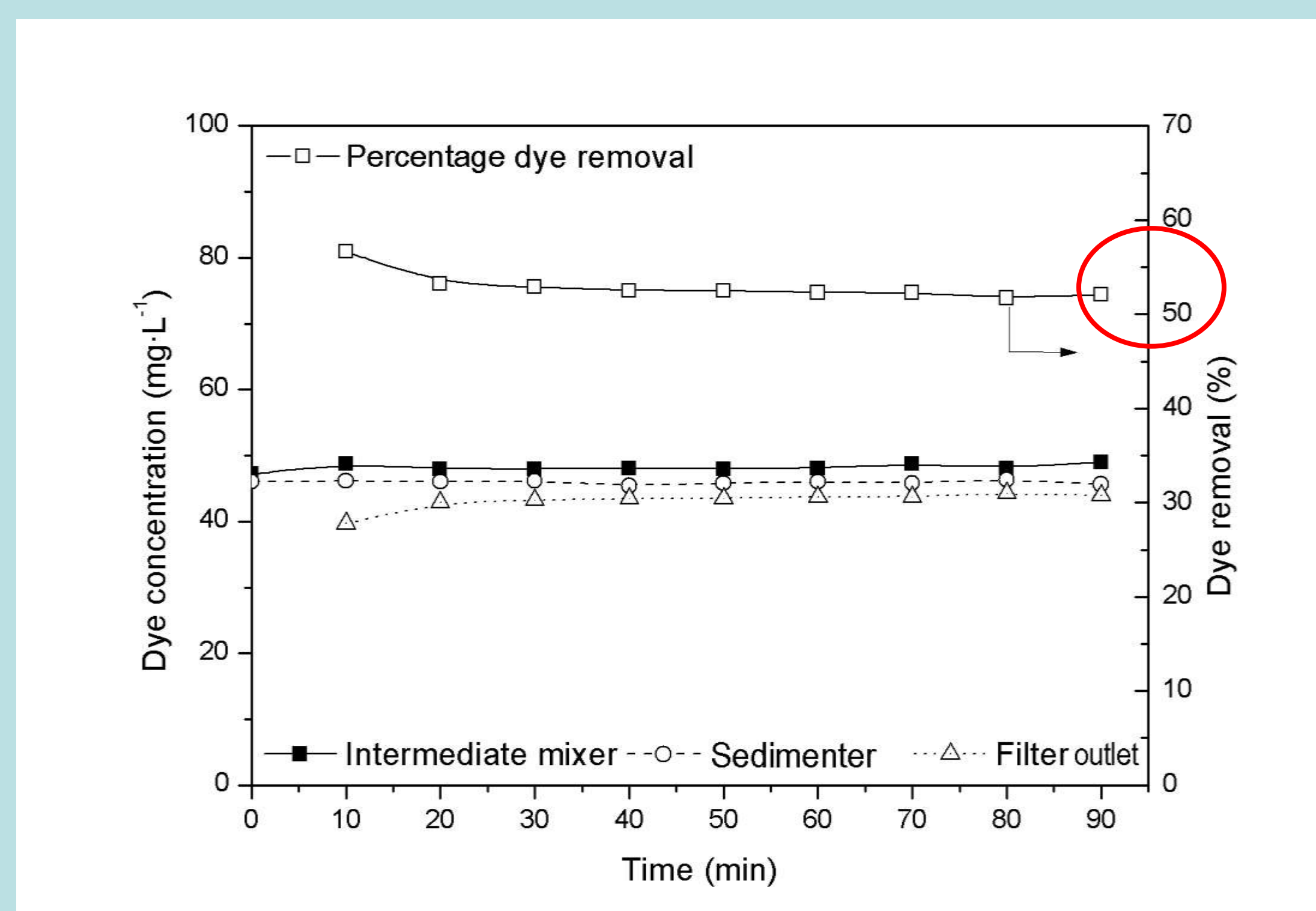


Figure 3. Dye removal

Some results and conclusions

- The steady state was reached almost at once.
- Similar behavior is presented in the case of surfactant and dye removal.
- High efficiency in dye and surfactant removal is achieved inside the early stages of continuous flow regime.
- Tanfloc is a highly effective treatment agent for the two types of wastewater.