

Strategies to manage undergraduate laboratory waste

Emerging pollutants and managing wastewater and waste

Challenge:

Development of a sustainable strategy to manage the undergraduate lab waste at pH 1 and containing 17 metal ions.

Strategy:

- i) Synthesis and characterization of biopolymer based adsorbents
- ii) Column adsorption process

Metal	Concentration (mg/L)
Pb	10.07
K	5597
Ca	91.30
Sr	45.18
Cr	184.2
Mn	63.3
Fe	212.3
Co	15.61
Ni	24.81
Cu	356.1
Zn	19.84
Ag	0.4182
Au	0.0646
Hg	1.049
Al	6.663
Mg	20.95
Na	2601

(CHI)



Adsorbents:

Chitosan/sugar cane bagasse



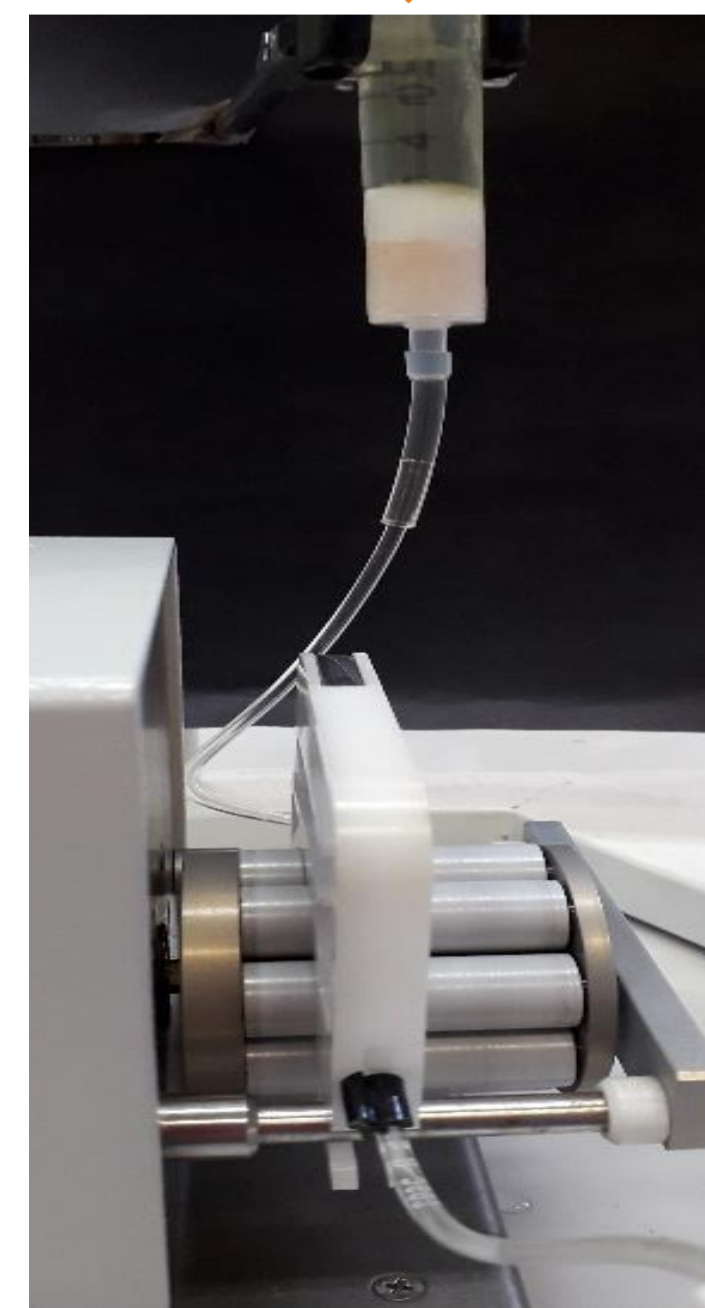
(CHI/BG)

Young modulus: 40 ± 5 kPa 375 ± 40 kPa
Excellent stability in pH 1 * positively charged



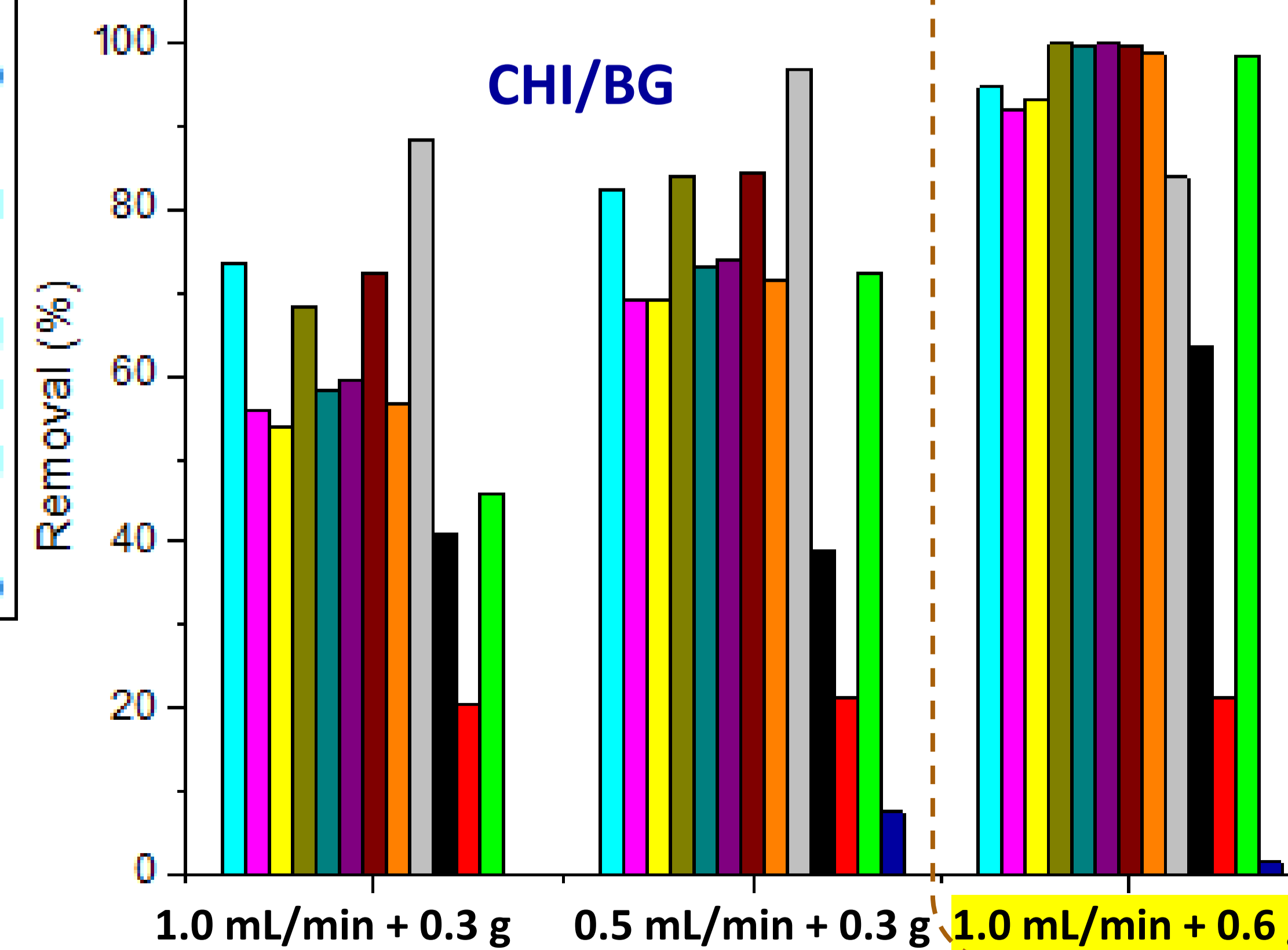
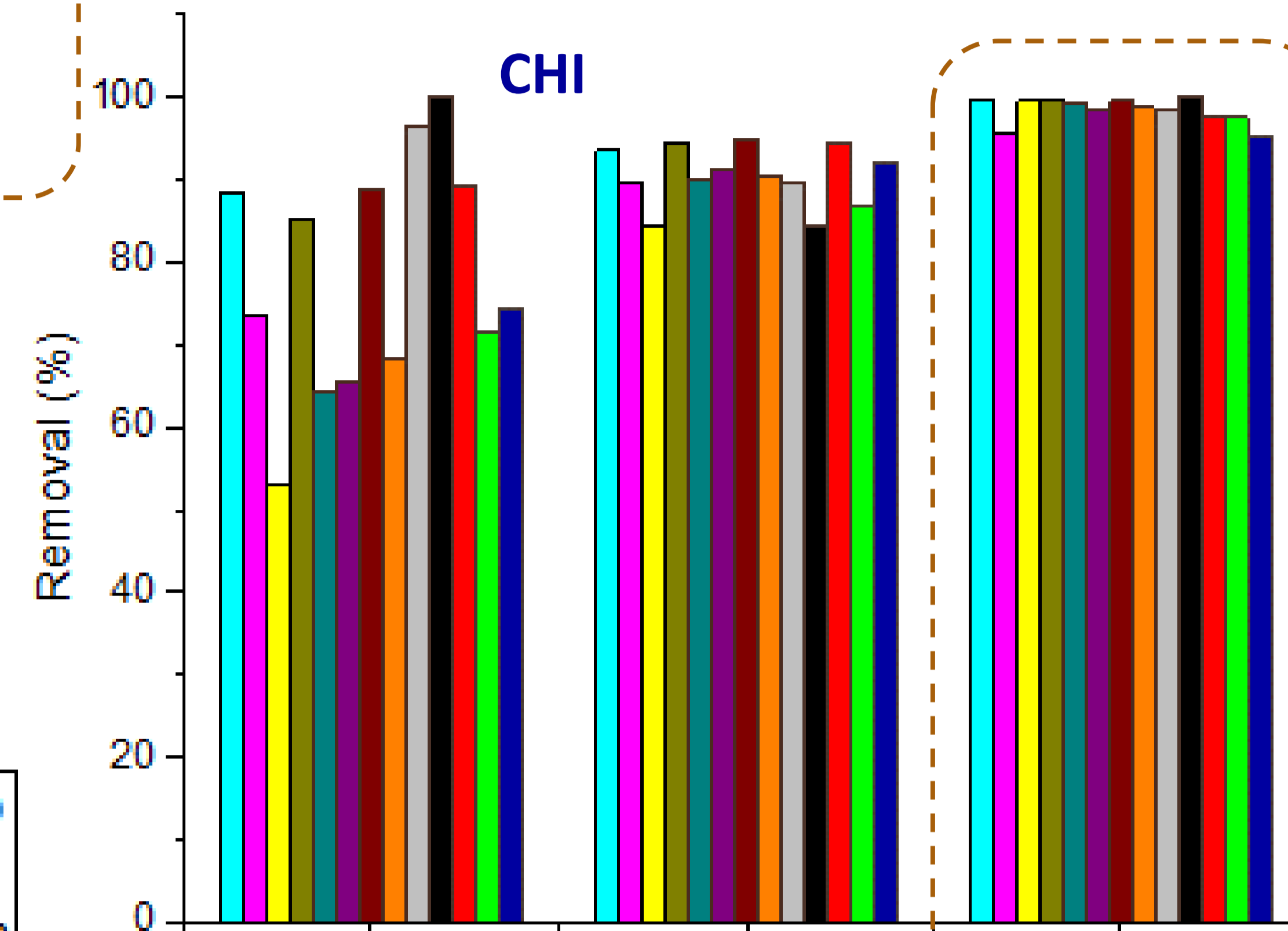
Metal chloride complex
 $[MeCl_4]^{2-}$

Lab waste



Peristaltic pump

Removal capacity



inductively coupled plasma atomic emission spectrometry (ICP-OES)