

## Rimobilizzazione di metalli in traccia

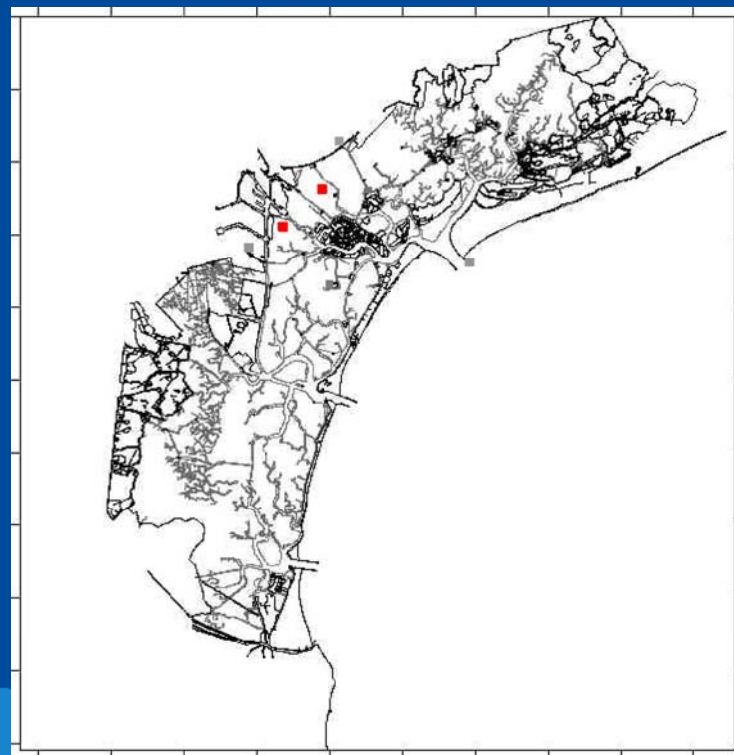
**Clara TURETTA**

*Istituto per la Dinamica dei Processi Ambientali - CNR Venezia*

**Gabriele CAPODAGLIO**

*Dip. Scienze Ambientali  
Università Ca' Foscari Venezia*

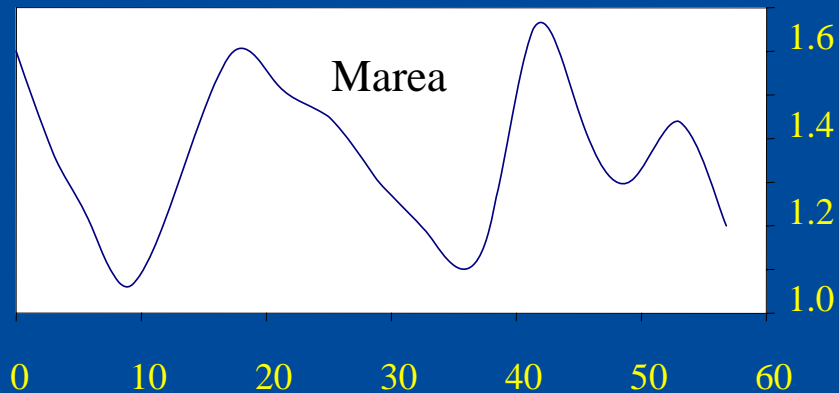
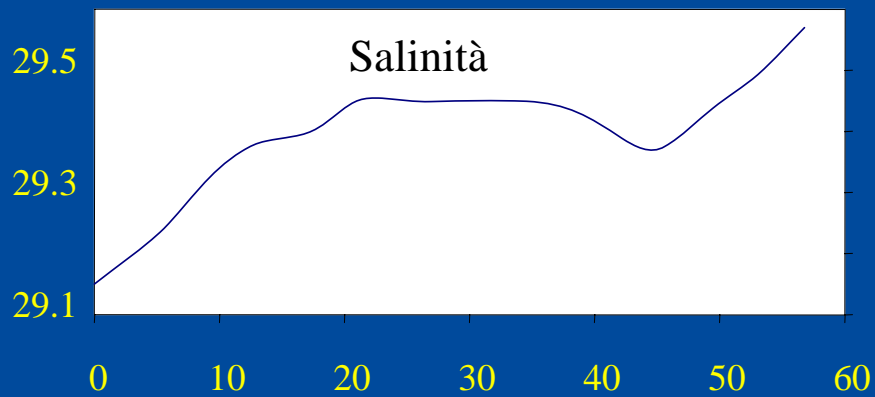
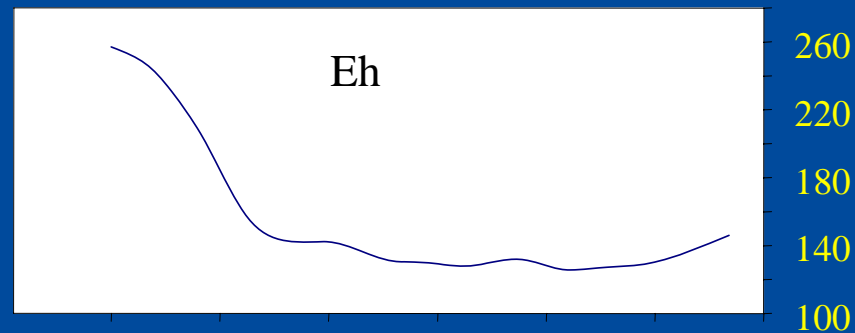
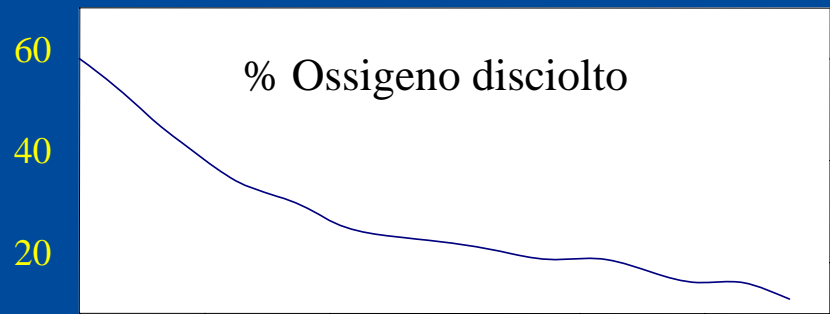
**Camere Bentiche:  
esperimento 3  
28 - 30 ottobre 2002**



La struttura delle camere bentiche è stata modificata, rispetto a quella dei primi esperimenti, aumentandone il peso e applicando una pellicola scura sulla parte superiore.



Sono state effettuate, per la durata dell'intero esperimento, misure di temperatura, salinità, pH, Eh, ossigeno disciolto.



## **Metodologie**

Il trattamento dei campioni, a partire dalla filtrazione, è avvenuto in laboratorio ad atmosfera controllata classe 100, per prevenire problemi di contaminazione. I campioni sono stati diluiti 1:10 con acqua milliQ ed acidificati 10% v/v con HNO<sub>3</sub> ultrapuro. Ad ogni campione è stato aggiunto uno standard interno bi-elementare (Sc e Y, 1 ppb). La quantificazione è avvenuta mediante curva di calibrazione ottenuta mediante aggiunte standard ad un campione di acqua di mare certificato (CRM-CASS4). Sono stati determinati i seguenti elementi:

**Ag, As, Cd, Co, Cr, Cu, Fe, Mn, Mo, Pb, Sb, U, V and Zn**

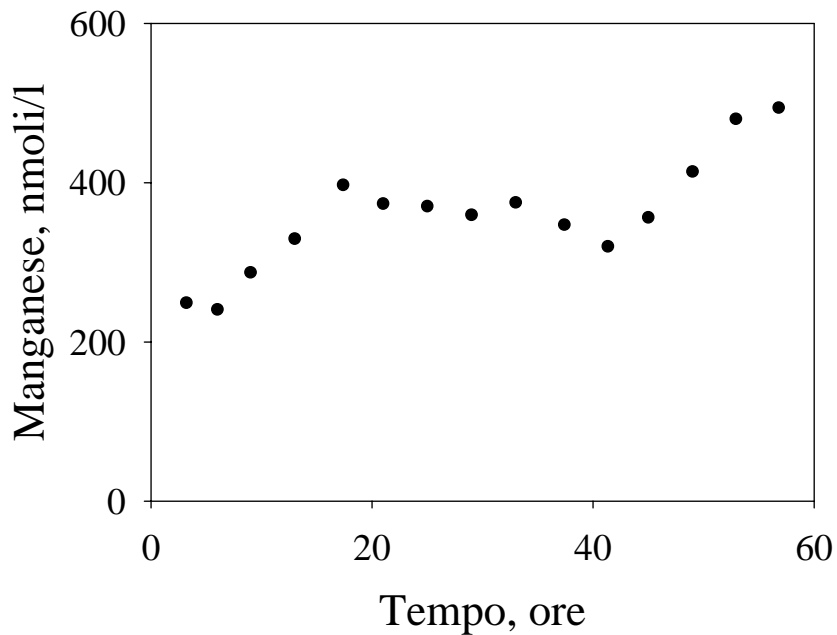
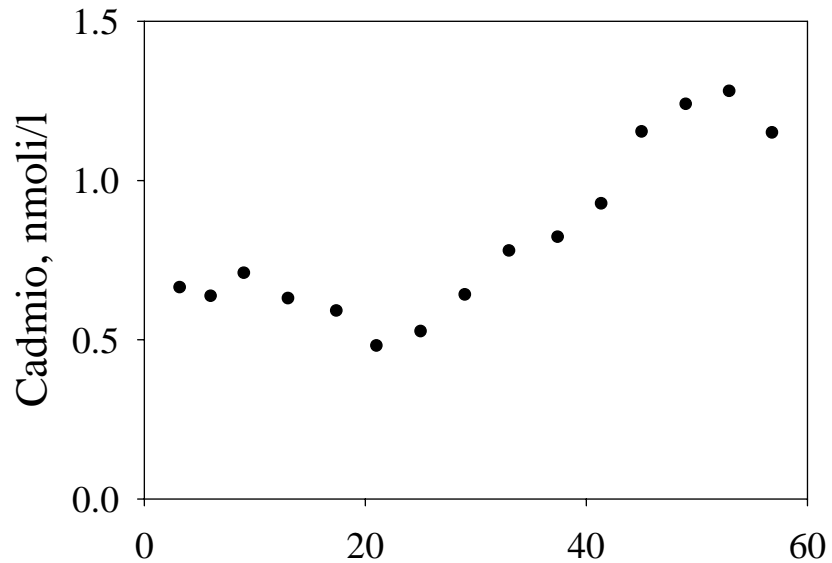
Accuratezza e precisione delle misure sono state valutate analizzando, prima di ogni sessione di misure, l'acqua di mare costiera certificata (CRM-CASS4) Le misure sono state effettuate con con ICP-SFMS e, per alcuni elementi, con ICP-QMS.

<b>Elemento</b>	<b>Valore certificato</b>	<b>Valore misurato Media di 6 misure</b>
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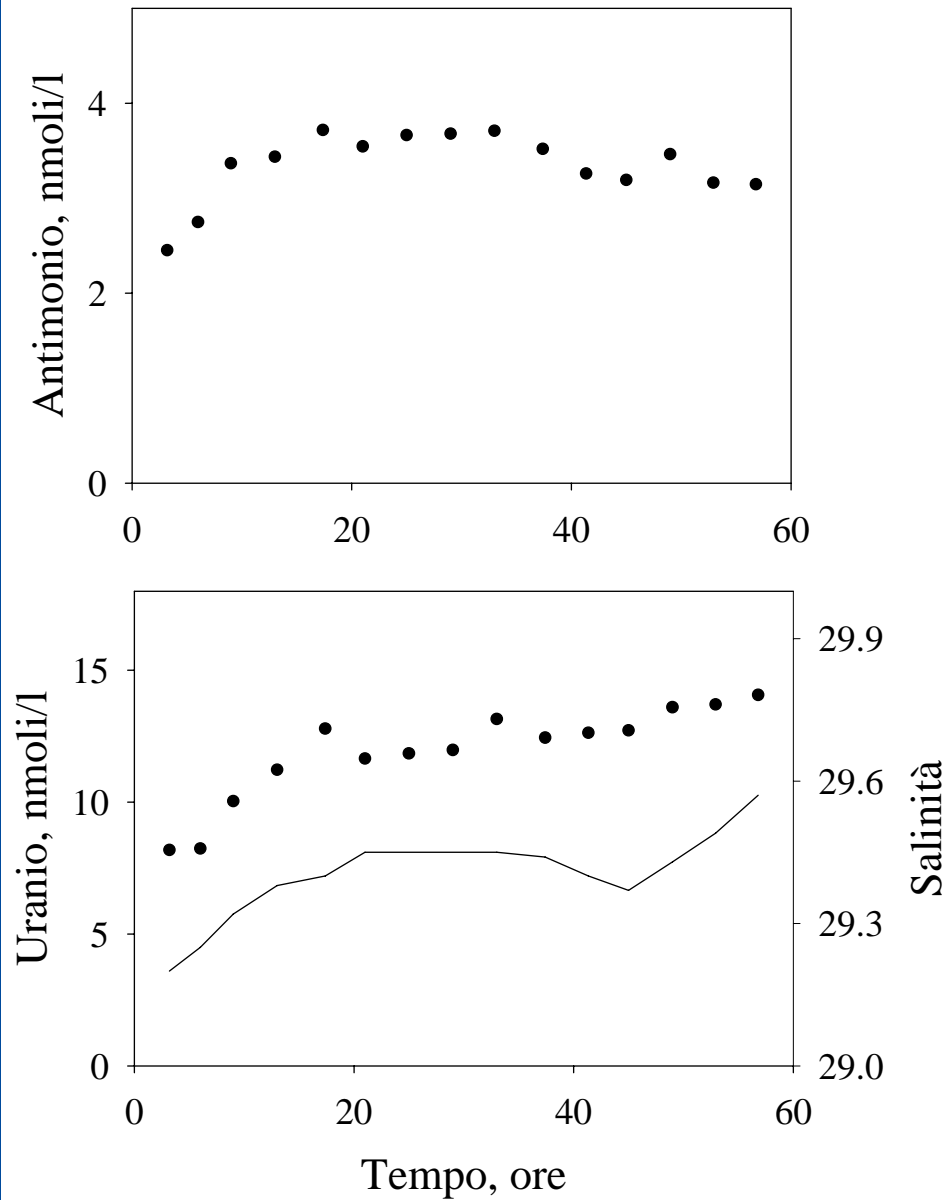
As	1.11±0.16	1.19
Cd	0.026±0.003	0.028
Co	0.026±0.003	0.027
Cr	0.144±0.029	0.169
Cu	0.592±0.055	0.601
Fe	0.713±0.058	0.706
Mn	2.78±0.19	2.72
Mo	8.78±0.86	8.59
Pb	0.0098±0.0036	0.0098
U	3.0 <sup>a</sup>	2.7
V	1.18±0.16	1.21
Zn	0.381±0.057	0.363
Ag	--	0.0052
Sb	--	0.240

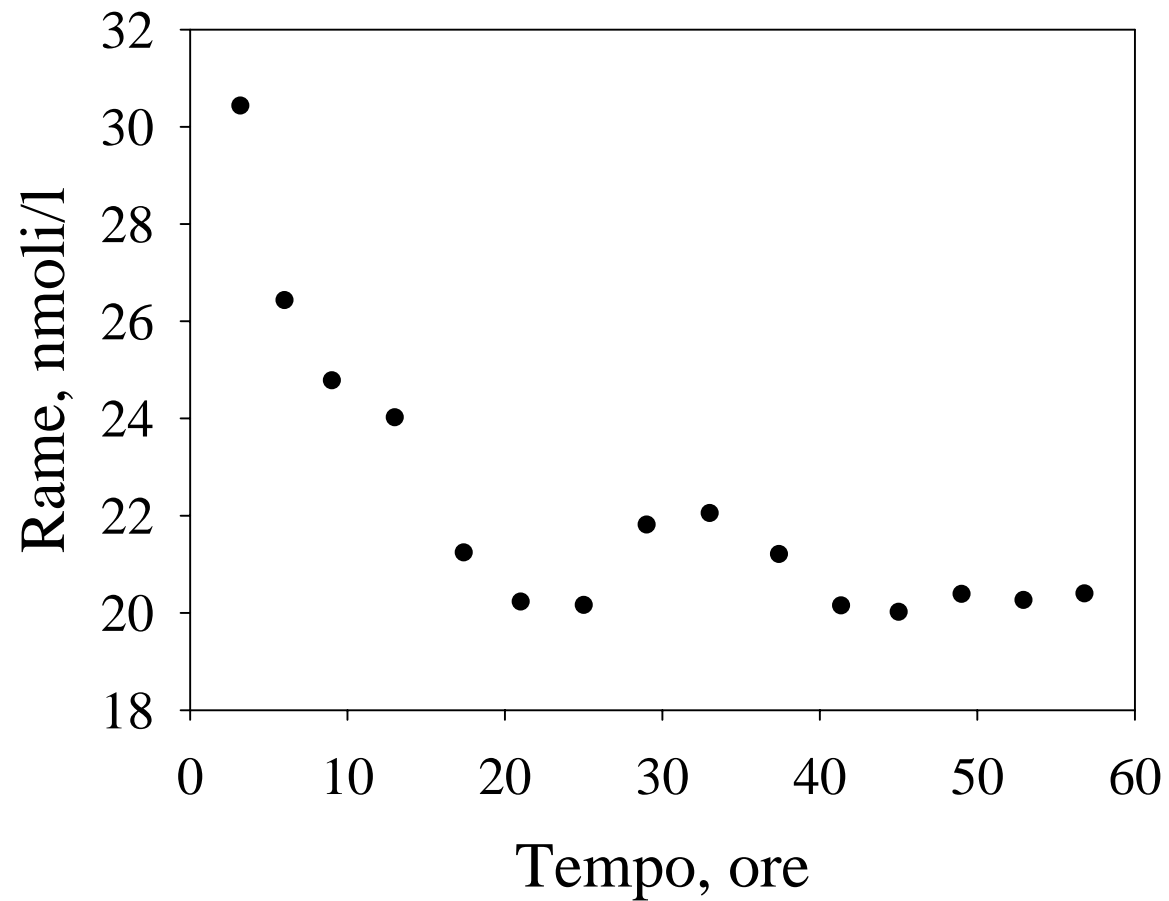
<sup>a</sup> valore informativo

Andamenti analoghi sono stati osservati per Co, Zn, Mo e As

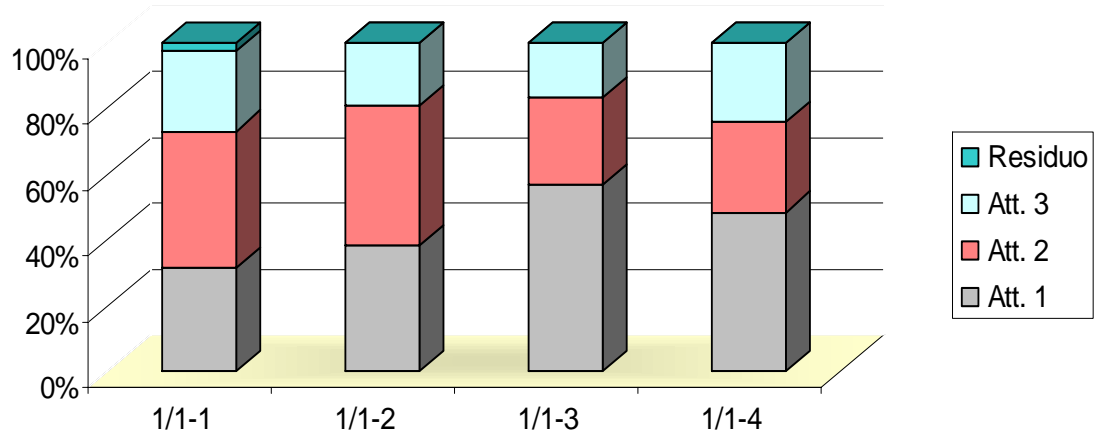


Andamenti analoghi sono stati osservati per Pb, V

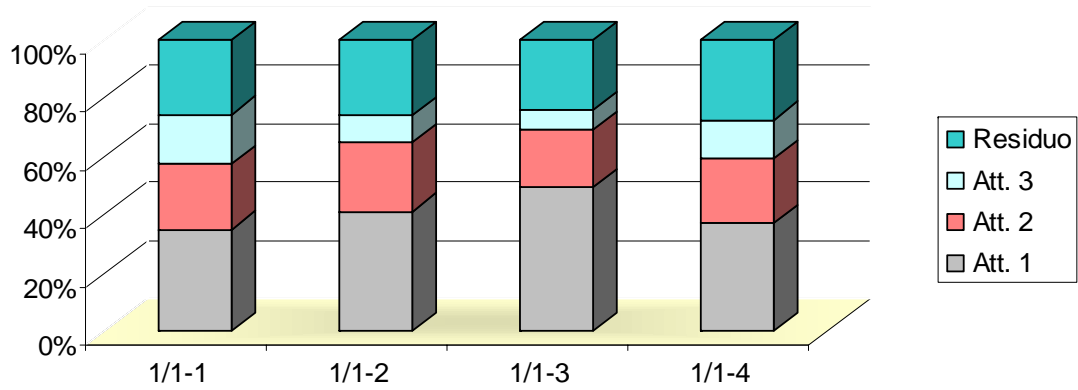




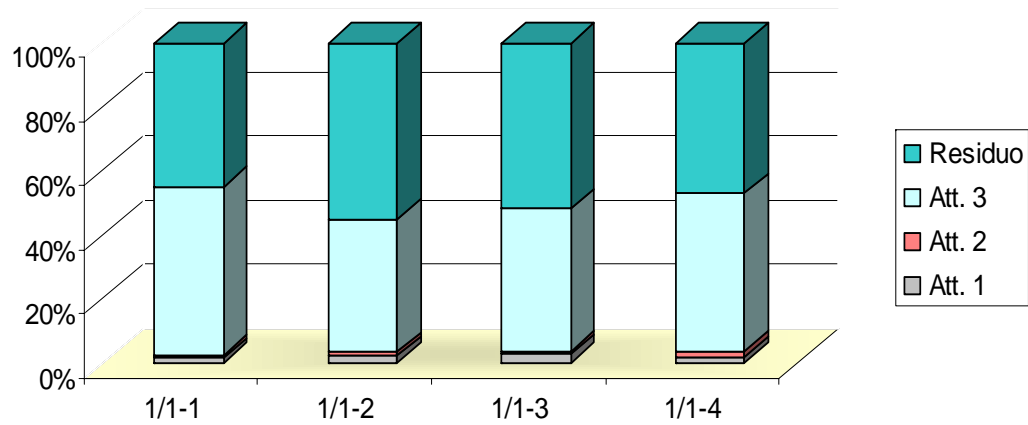
### Cd



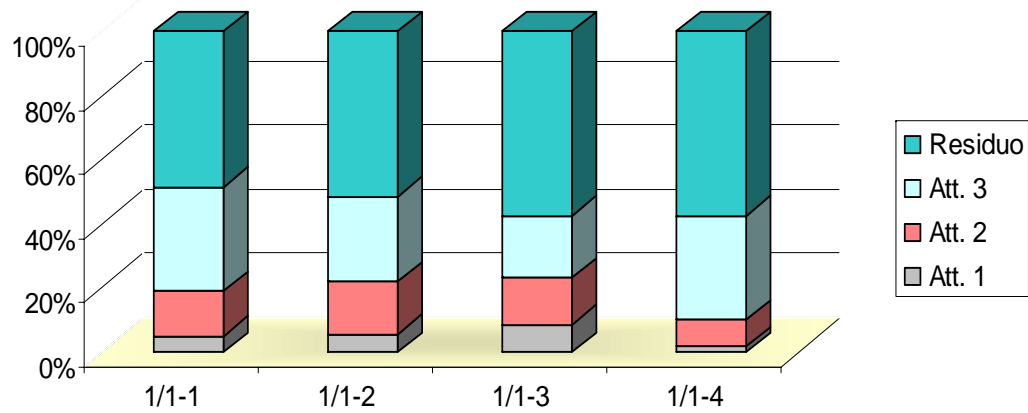
### Zn



### Cu



### Pb



# Metals and thiols in Venice lagoon waters

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# Methods

- Pb and Cd determined by anodic stripping voltammetry, using a mercury film electrode
- Thiols by cathodic stripping voltammetry, calibrated against glutathione
- In-situ analysis by standard ASV and CSV but using battery operated PalmSens and Pocket PC.

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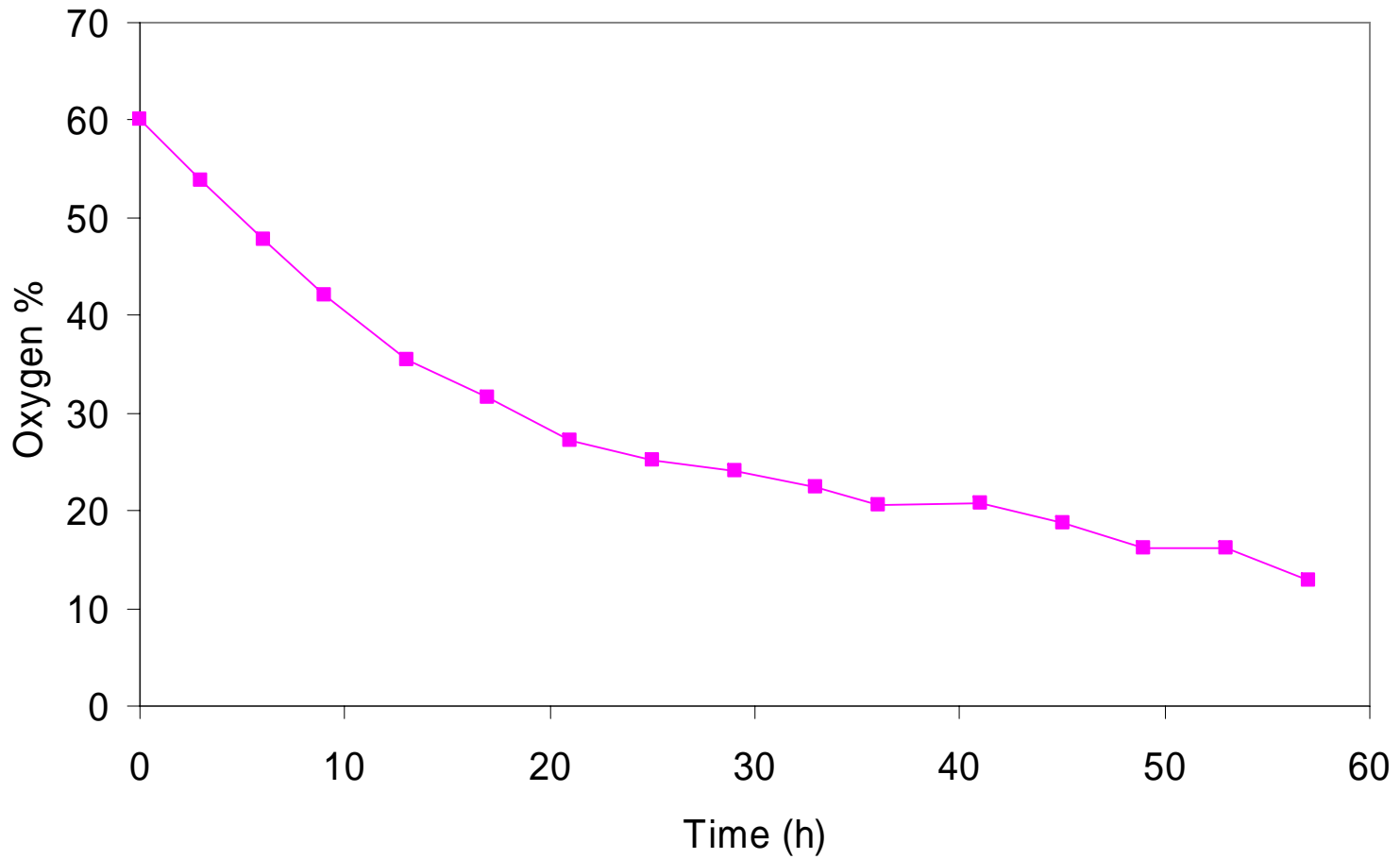
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Dissolved oxygen in the benthic chamber

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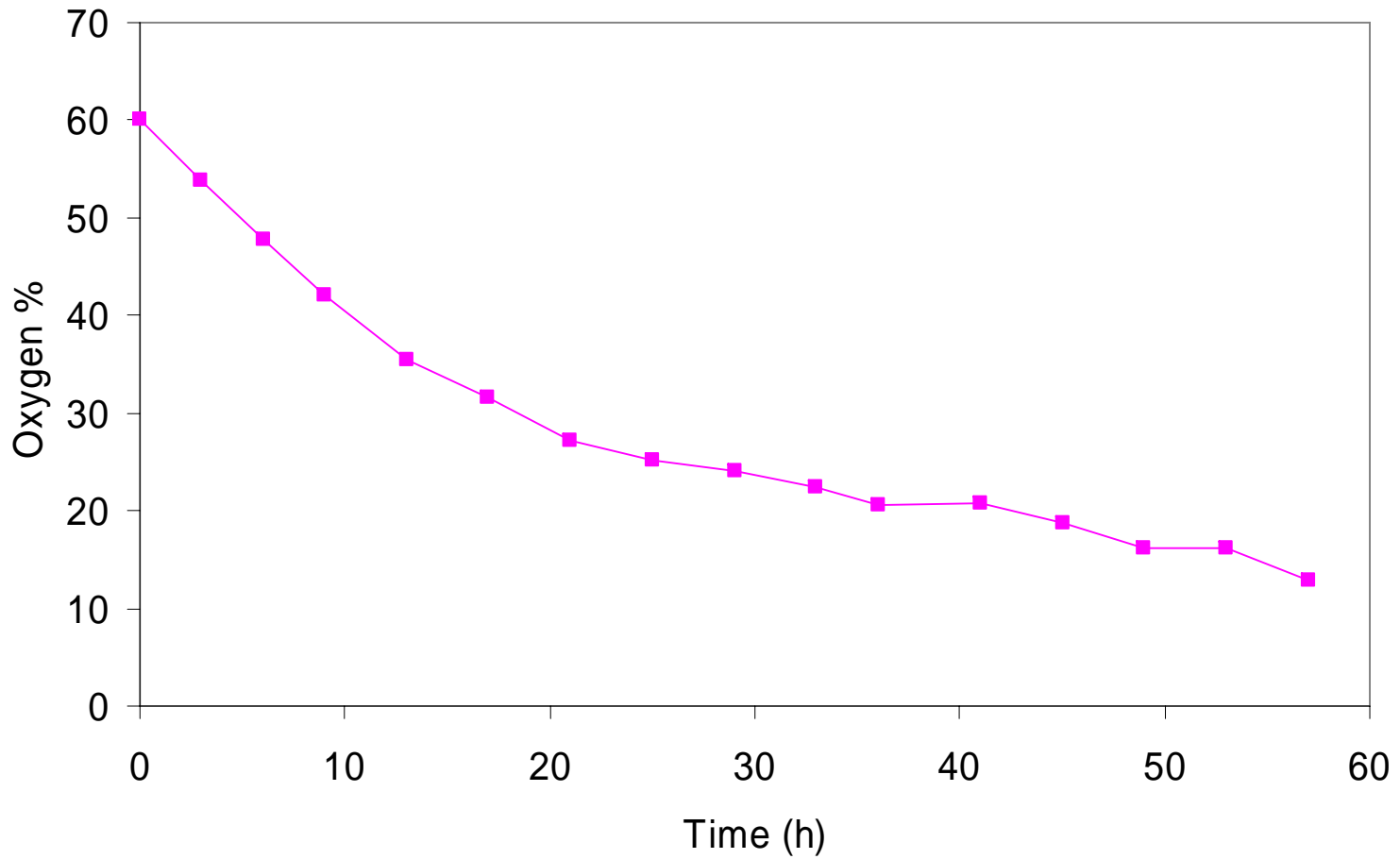
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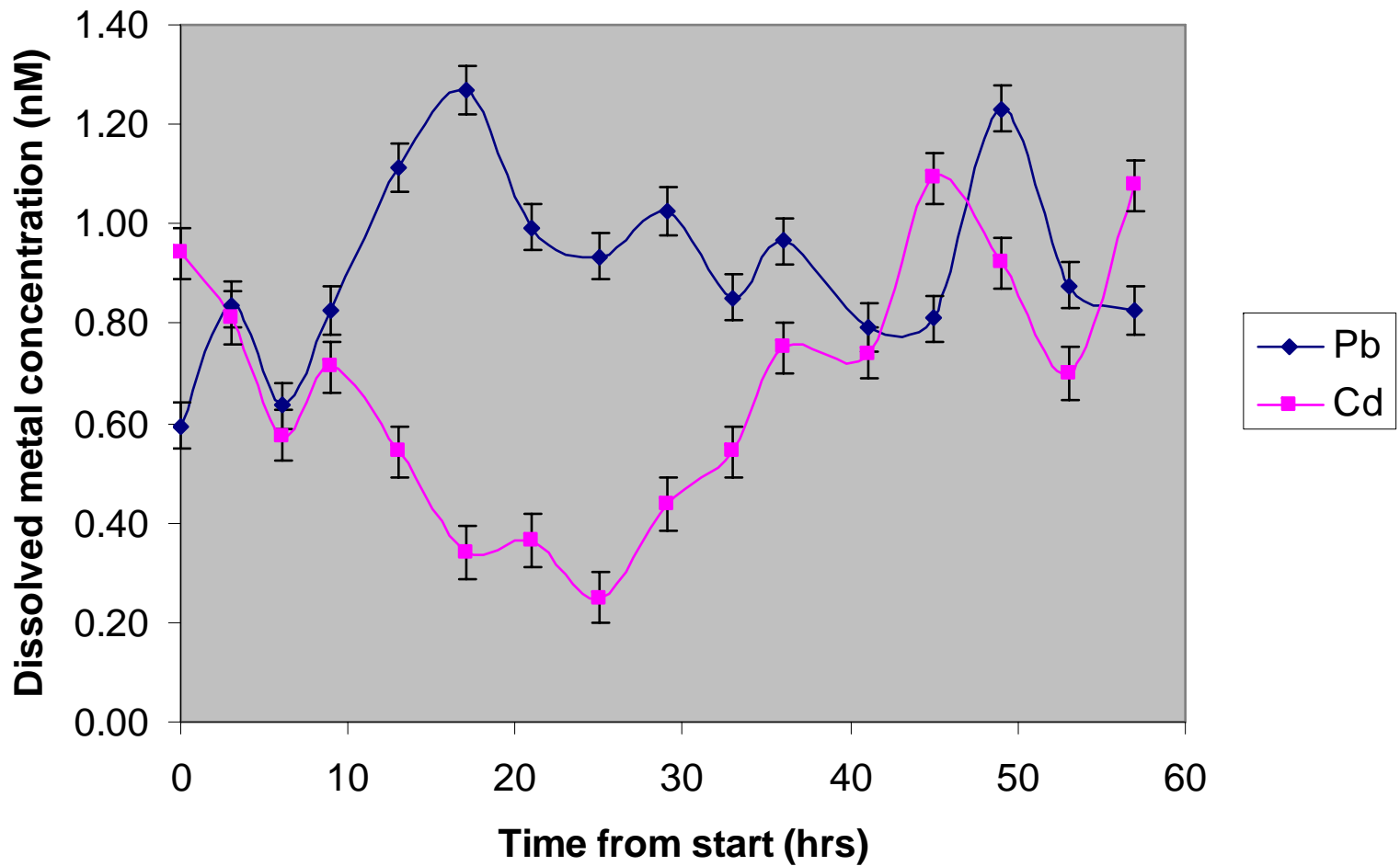
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Dissolved oxygen in the benthic chamber

## Total dissolved metal concentration Venice Lagoon Trip 3



Metals in the benthic chamber

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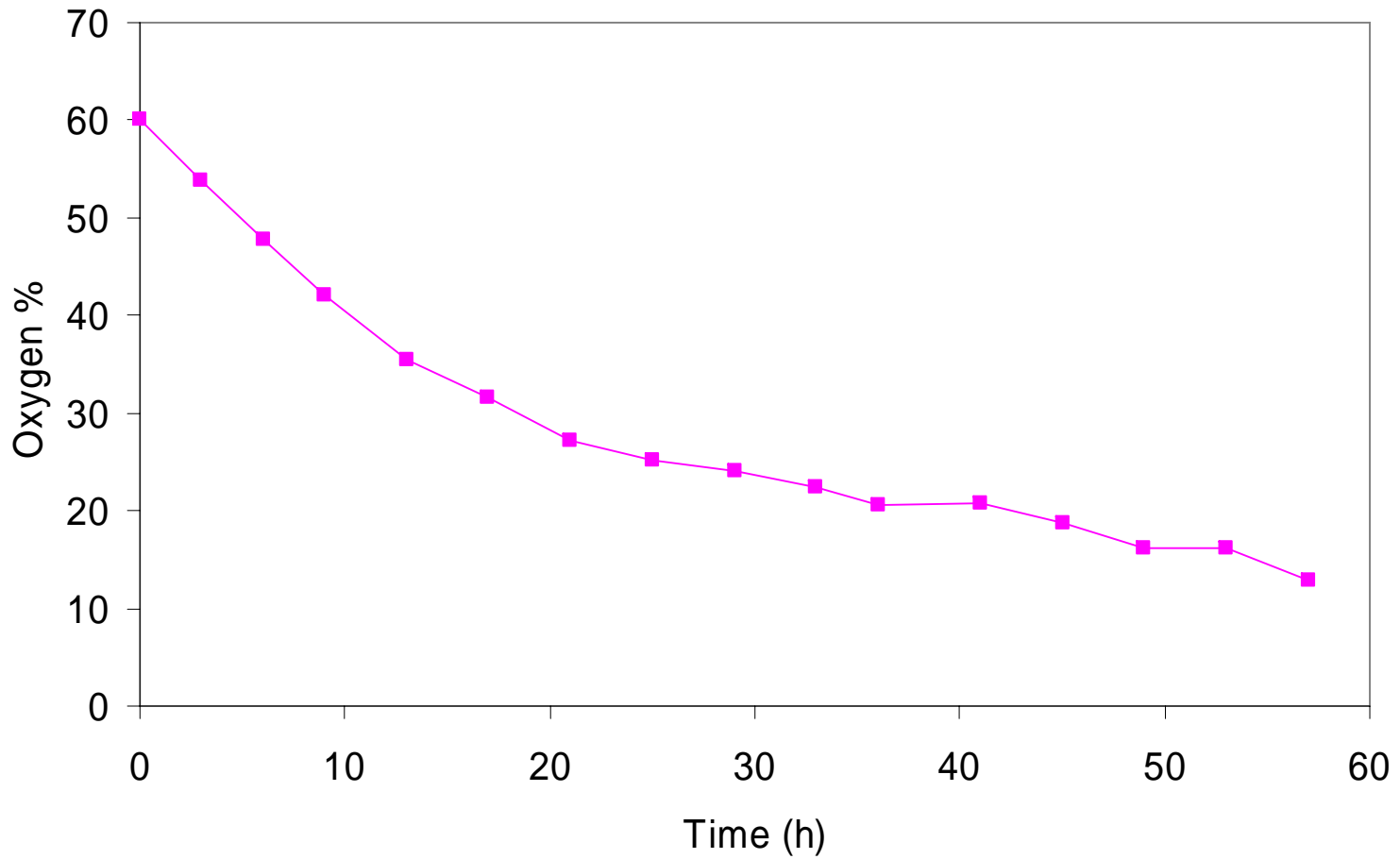
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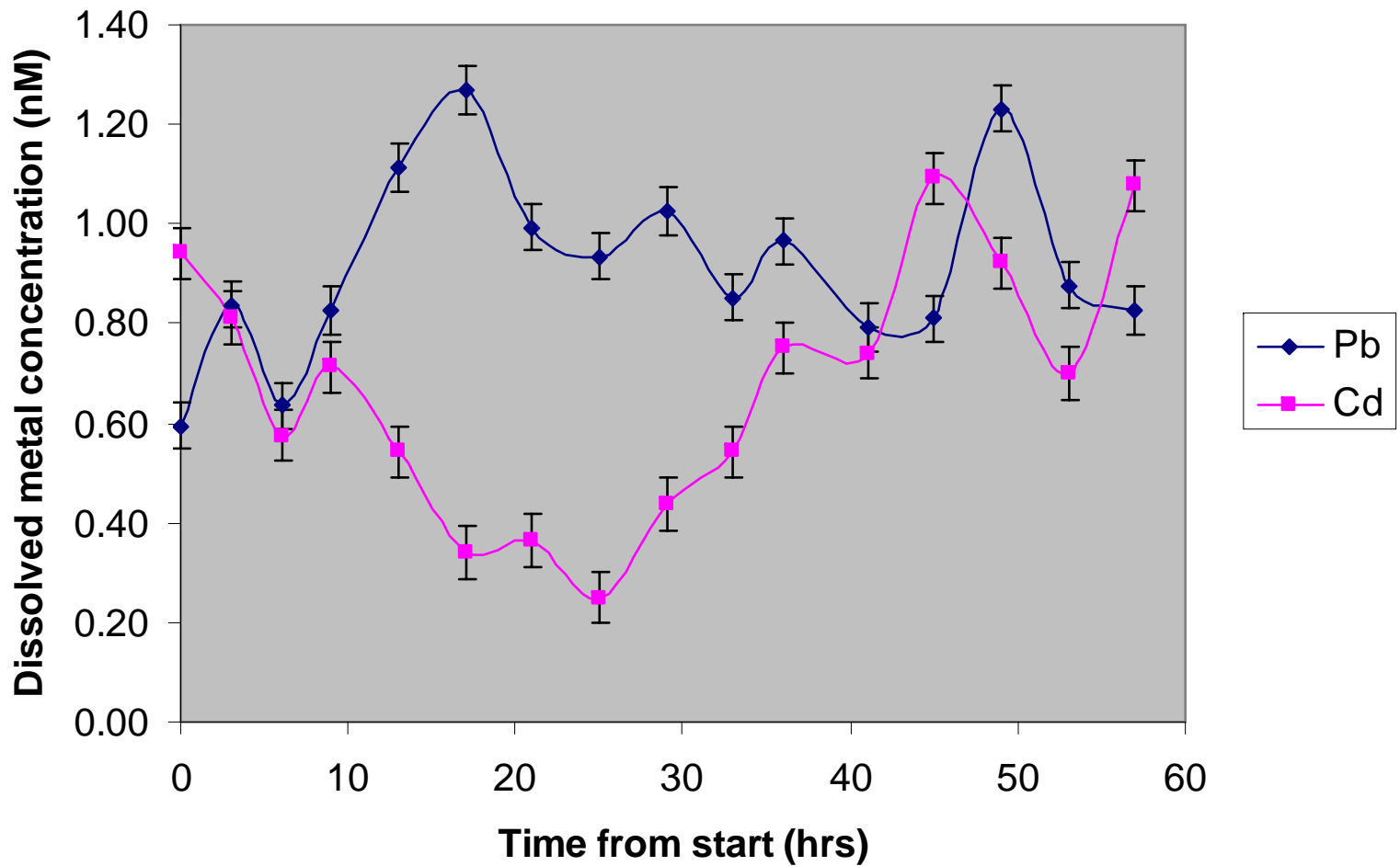
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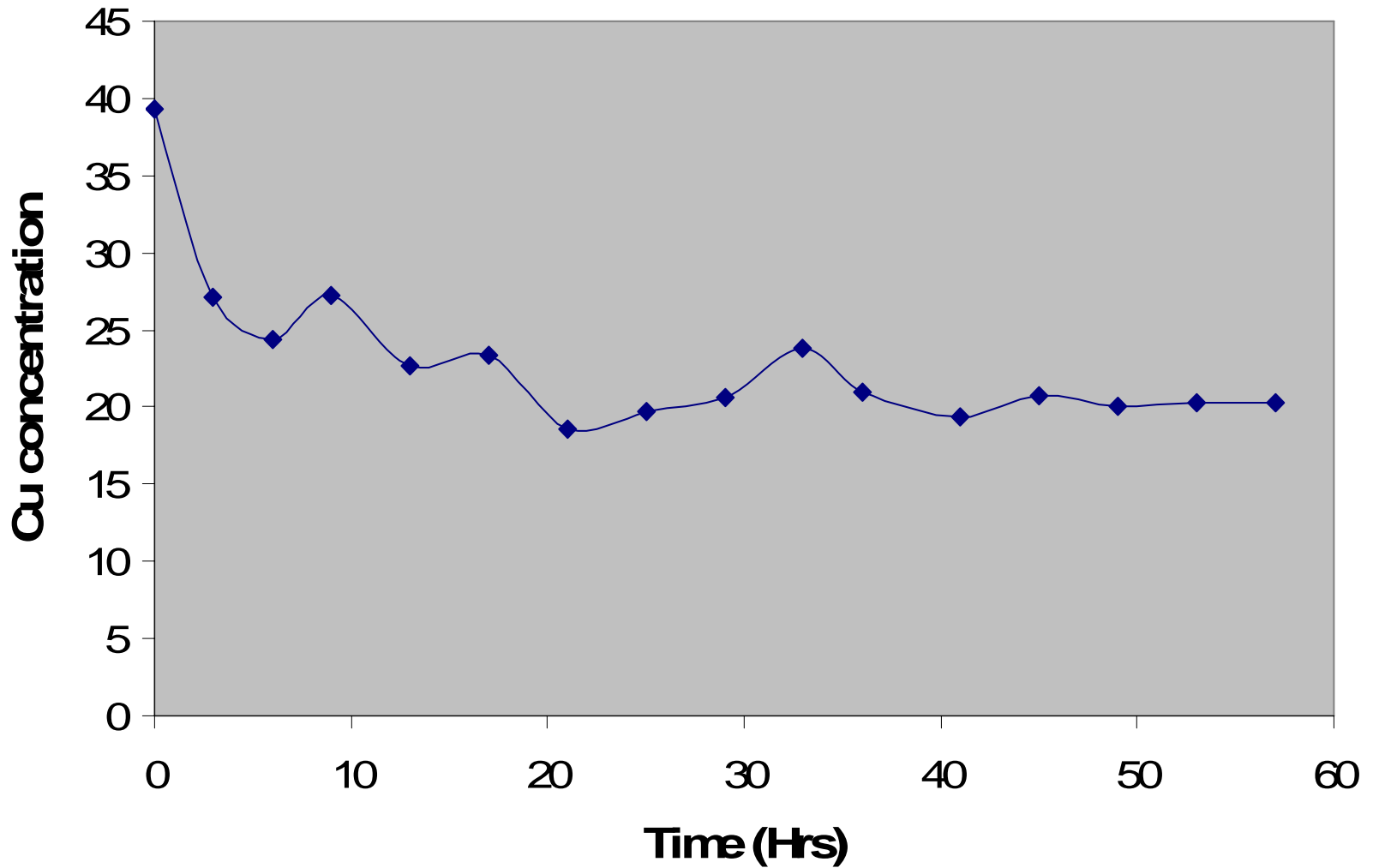
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Metals in the benthic chamber

## Total dissolved Cu concentration Venice Lagoon Trip 3



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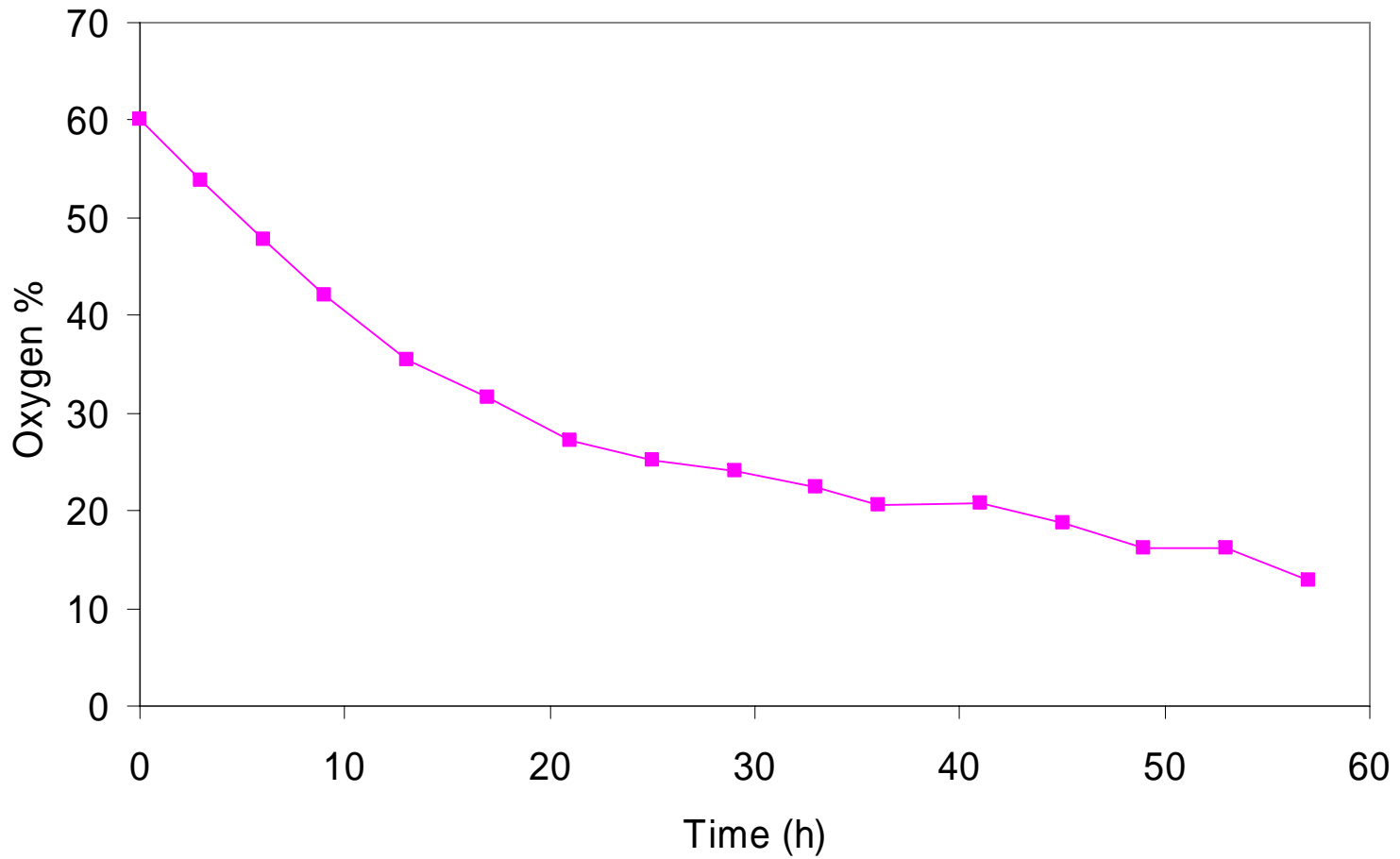
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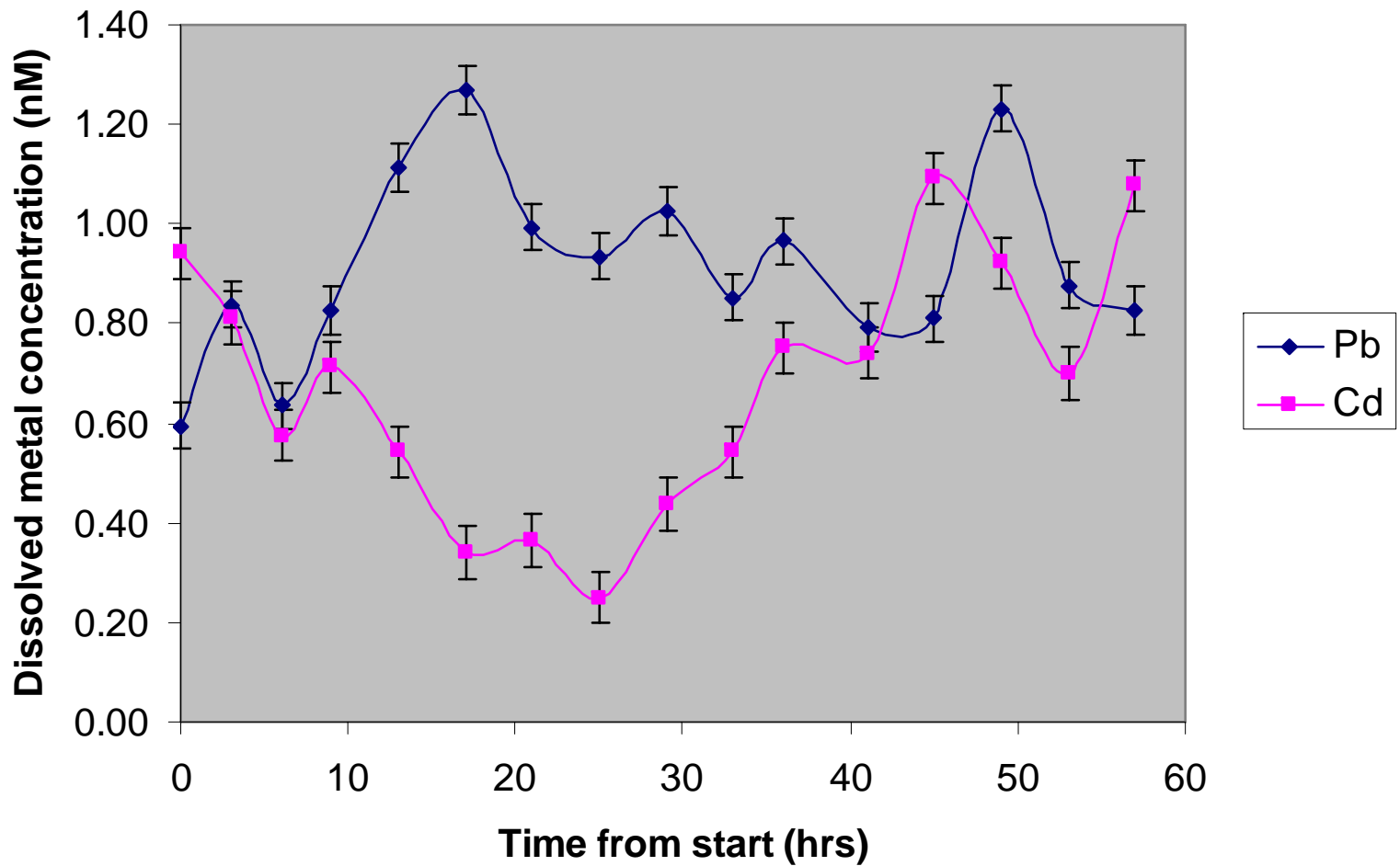
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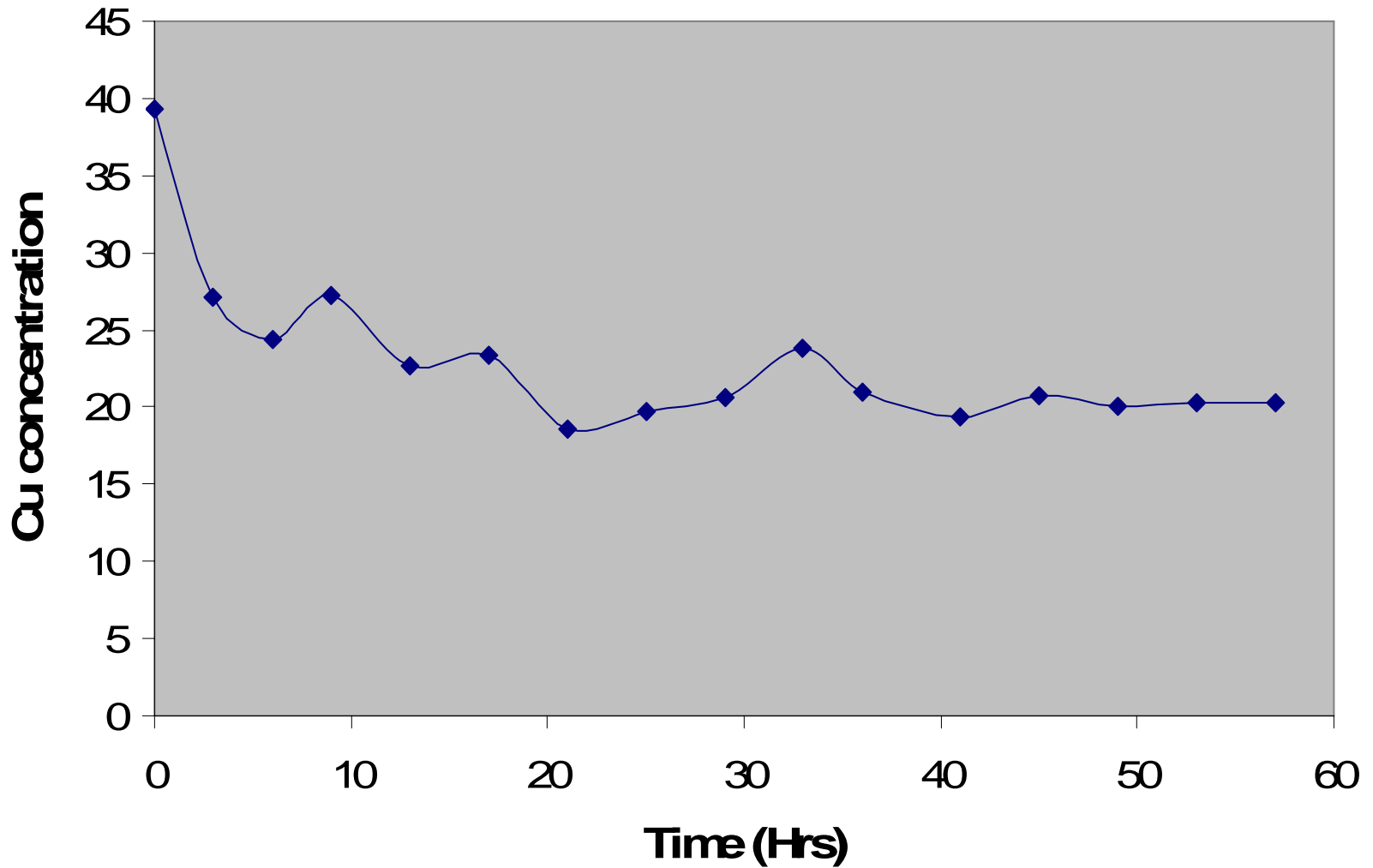
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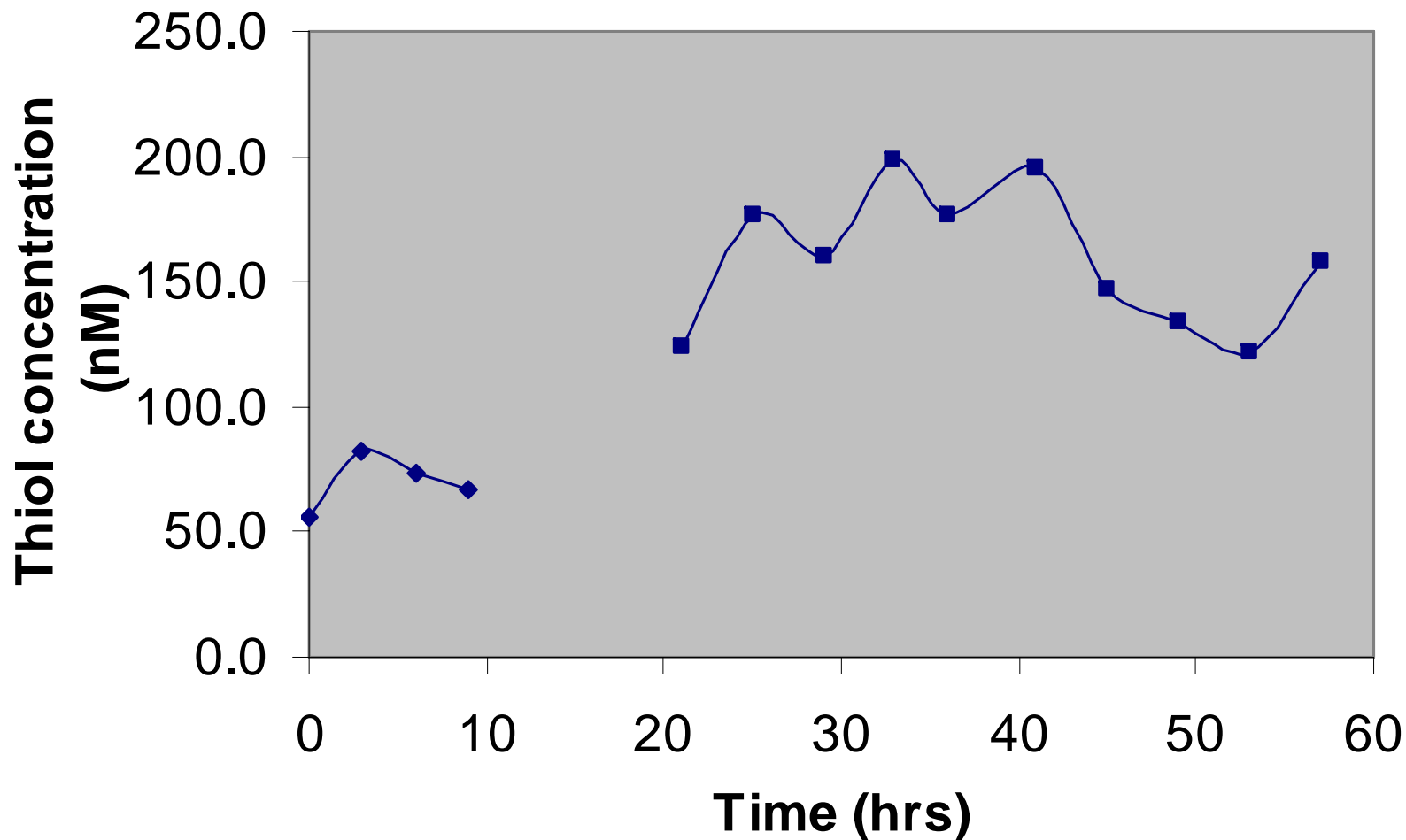


Metals in the benthic chamber

## Total dissolved Cu concentration Venice Lagoon Trip 3



## Thiol concentration calibrated using glutathione The Venice Lagoon Trip 3



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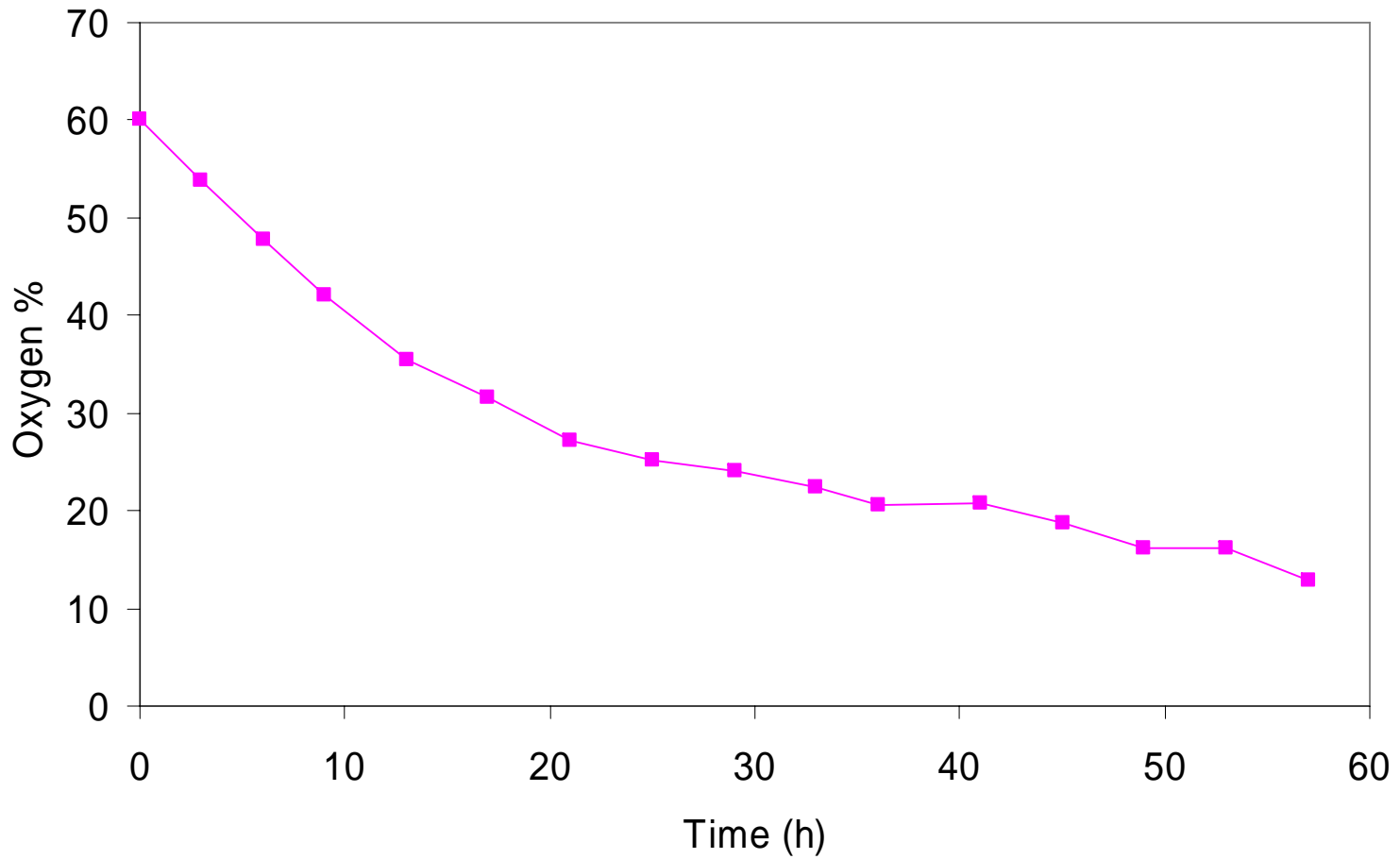
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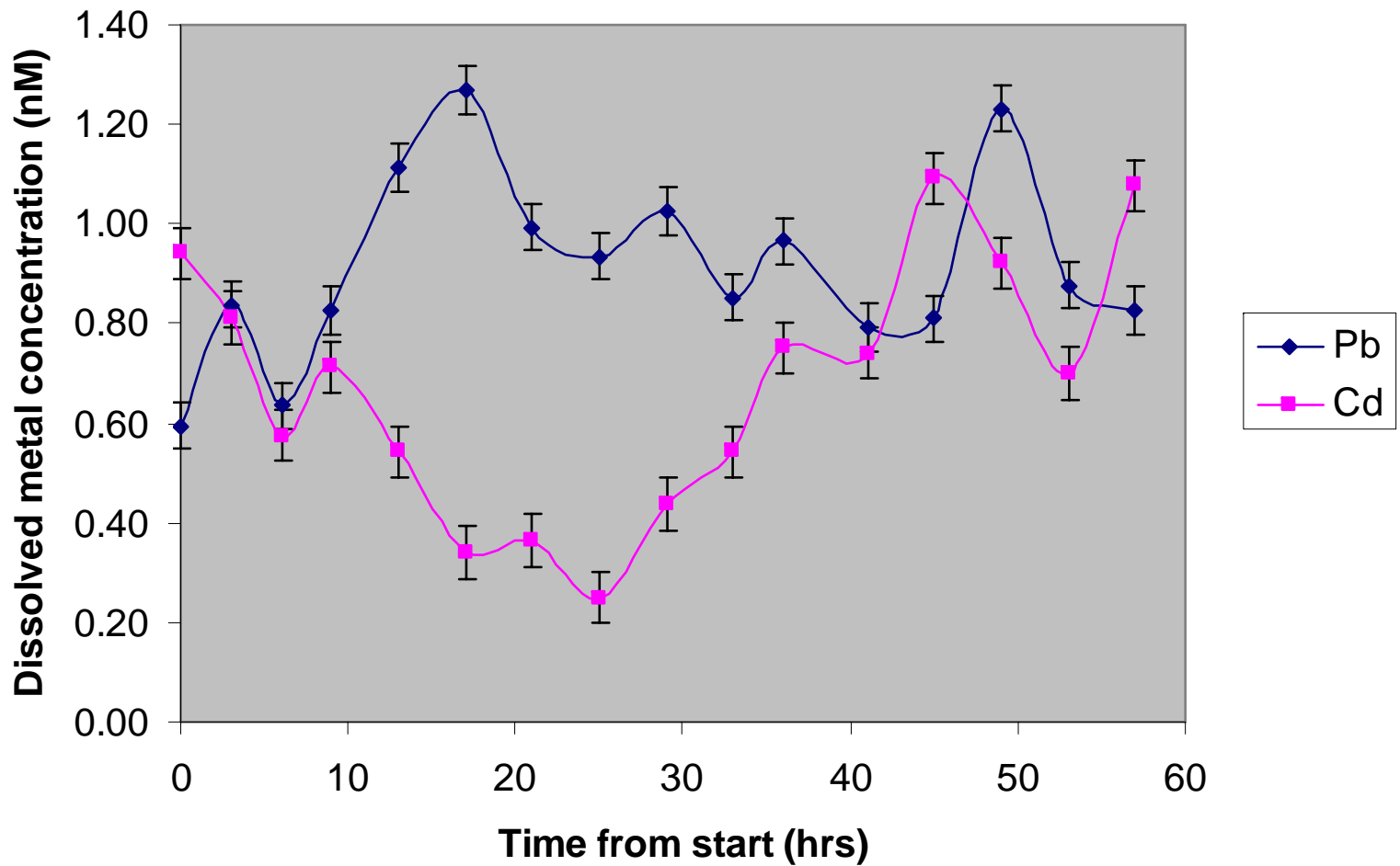
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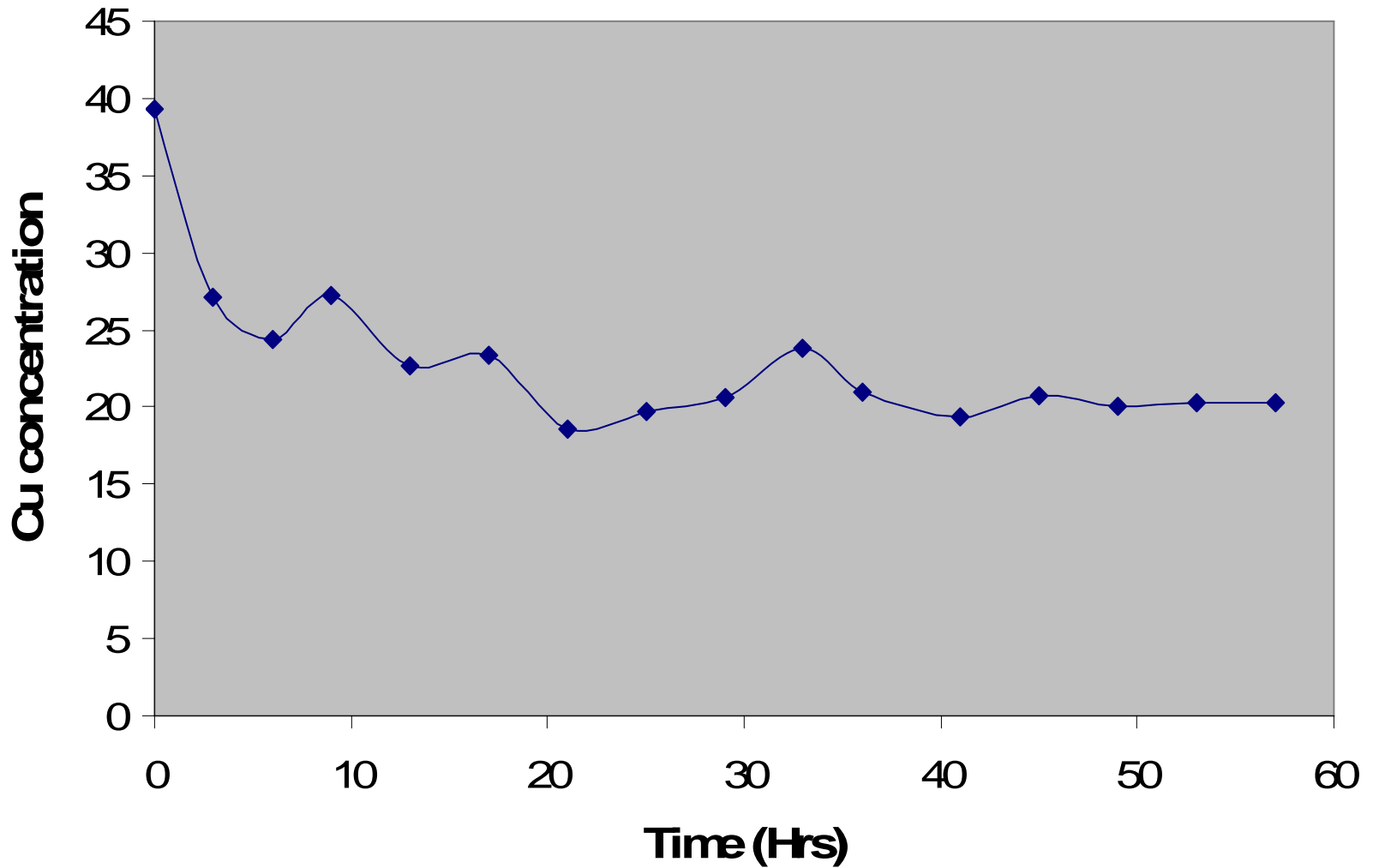
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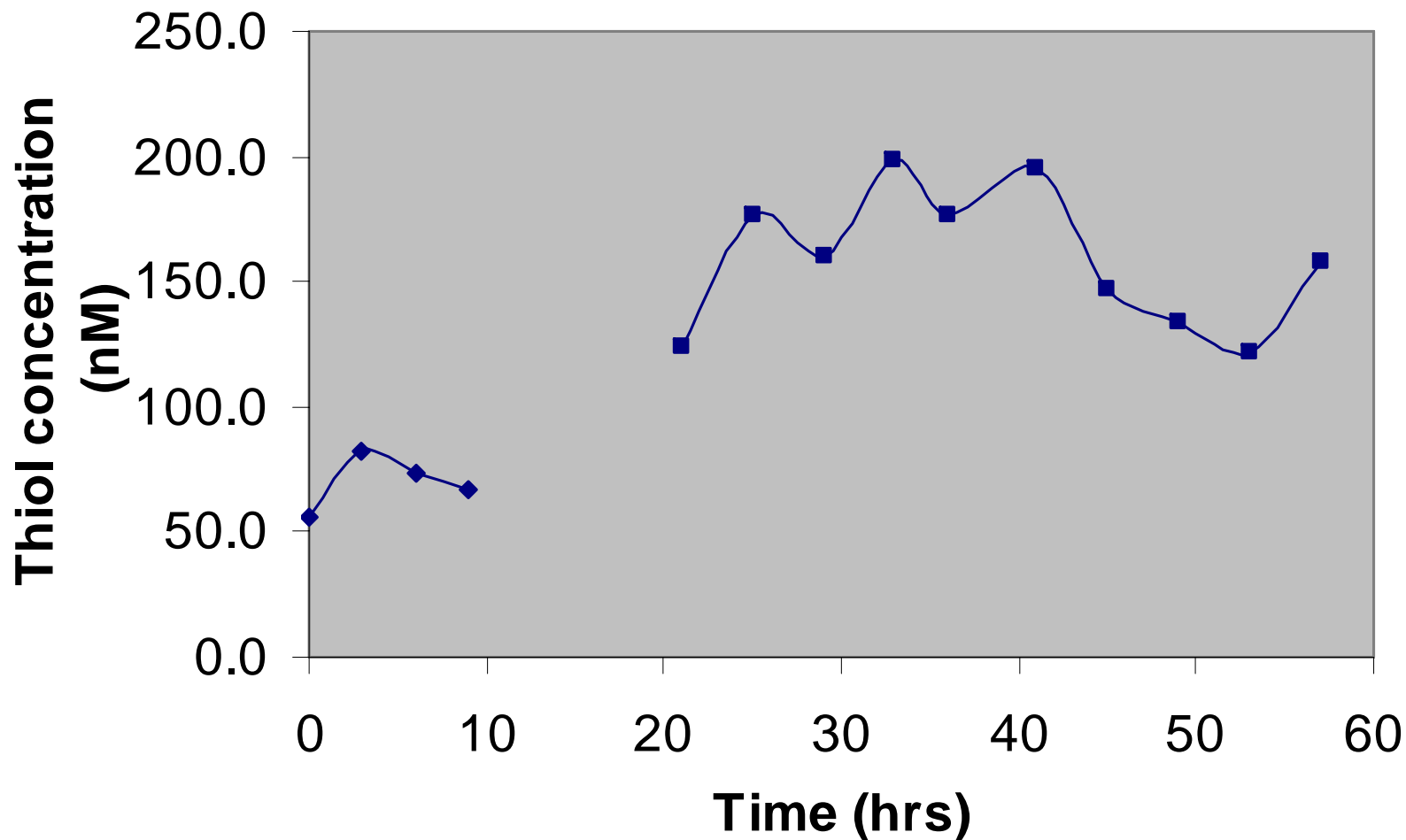


Metals in the benthic chamber

## Total dissolved Cu concentration Venice Lagoon Trip 3



## Thiol concentration calibrated using glutathione The Venice Lagoon Trip 3



# Metal complexation by thiols

- Thiols and metals can both be determined in Lagoon water. Metal additions lower the free thiol concentration, demonstrating that the thiols are binding the metals.
- The next slide shows the effect of metal additions on the thiol peak height.

# Metals and thiols in Venice lagoon waters

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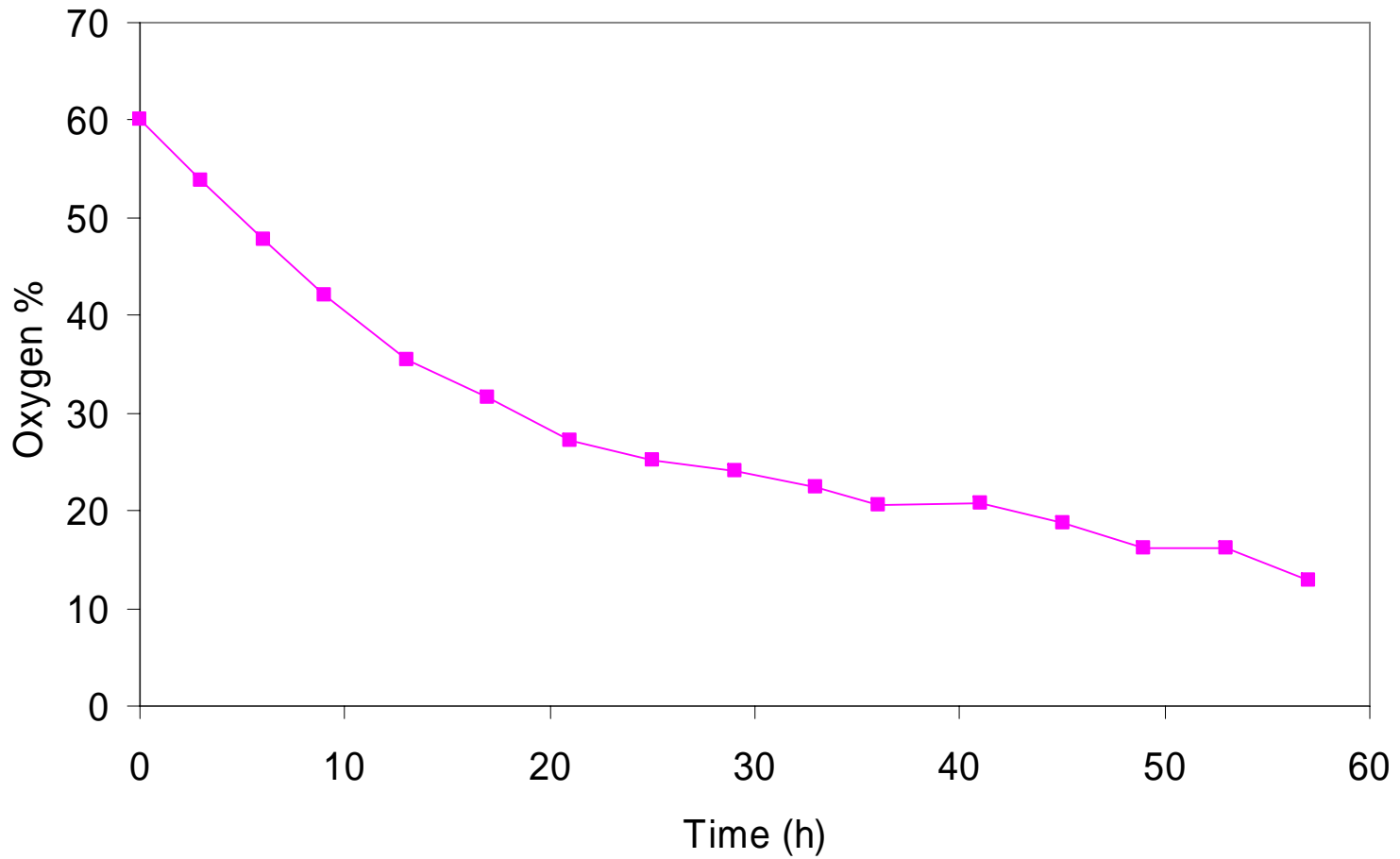
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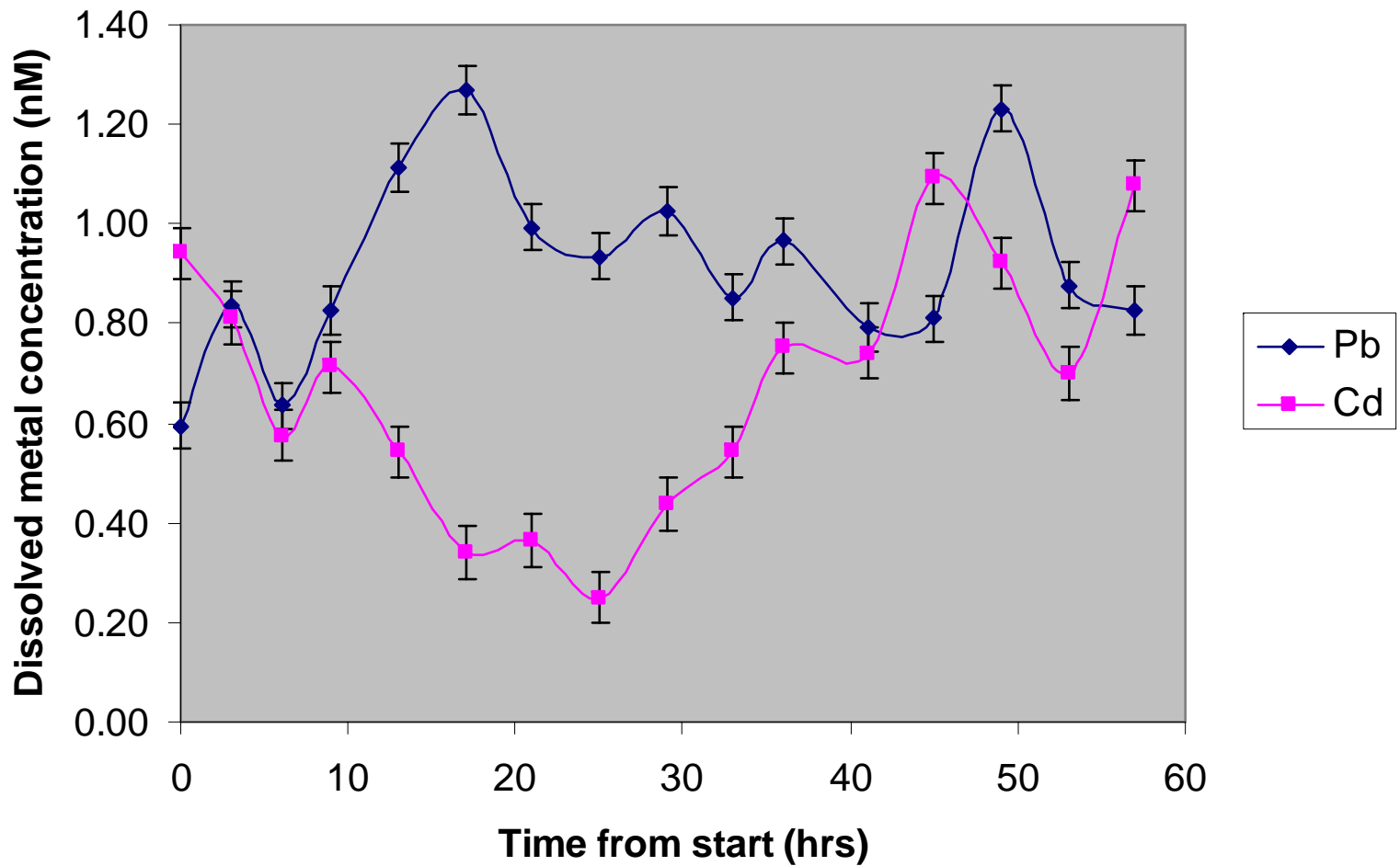
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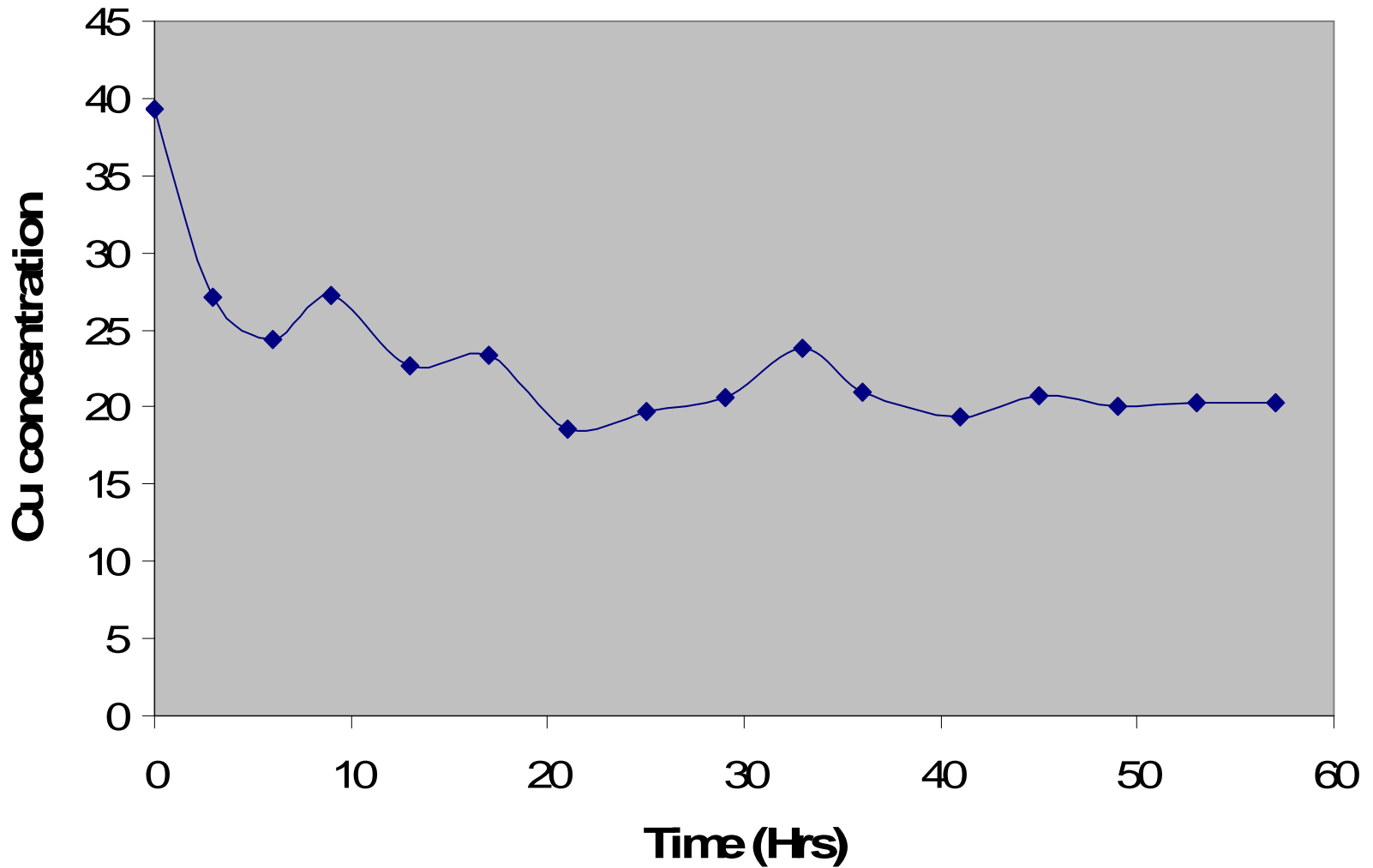
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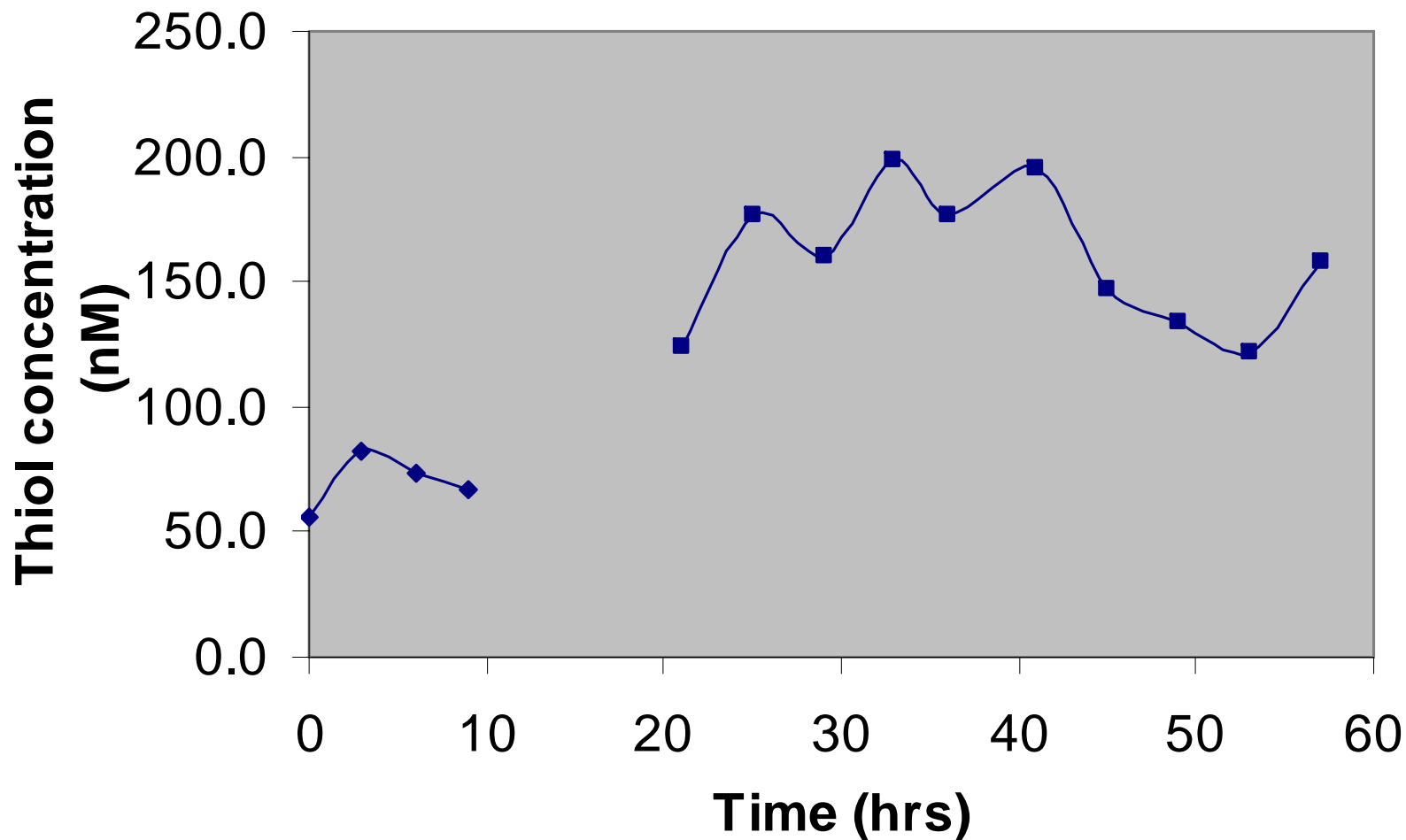


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## Thiol concentration calibrated using glutathione The Venice Lagoon Trip 3



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## Effect of adding Cu, Pb, and Cd, on the reactive thiol concentration in Lagoon water

	added metal (nM)	Peak height before	Peak height after	%reduction
Cu	125	28.3	1.6	<b>75</b>
Pb	100	20.9	11	<b>48</b>
Cd	100	22.1	18	<b>20</b>

# Metals and thiols in Venice lagoon waters

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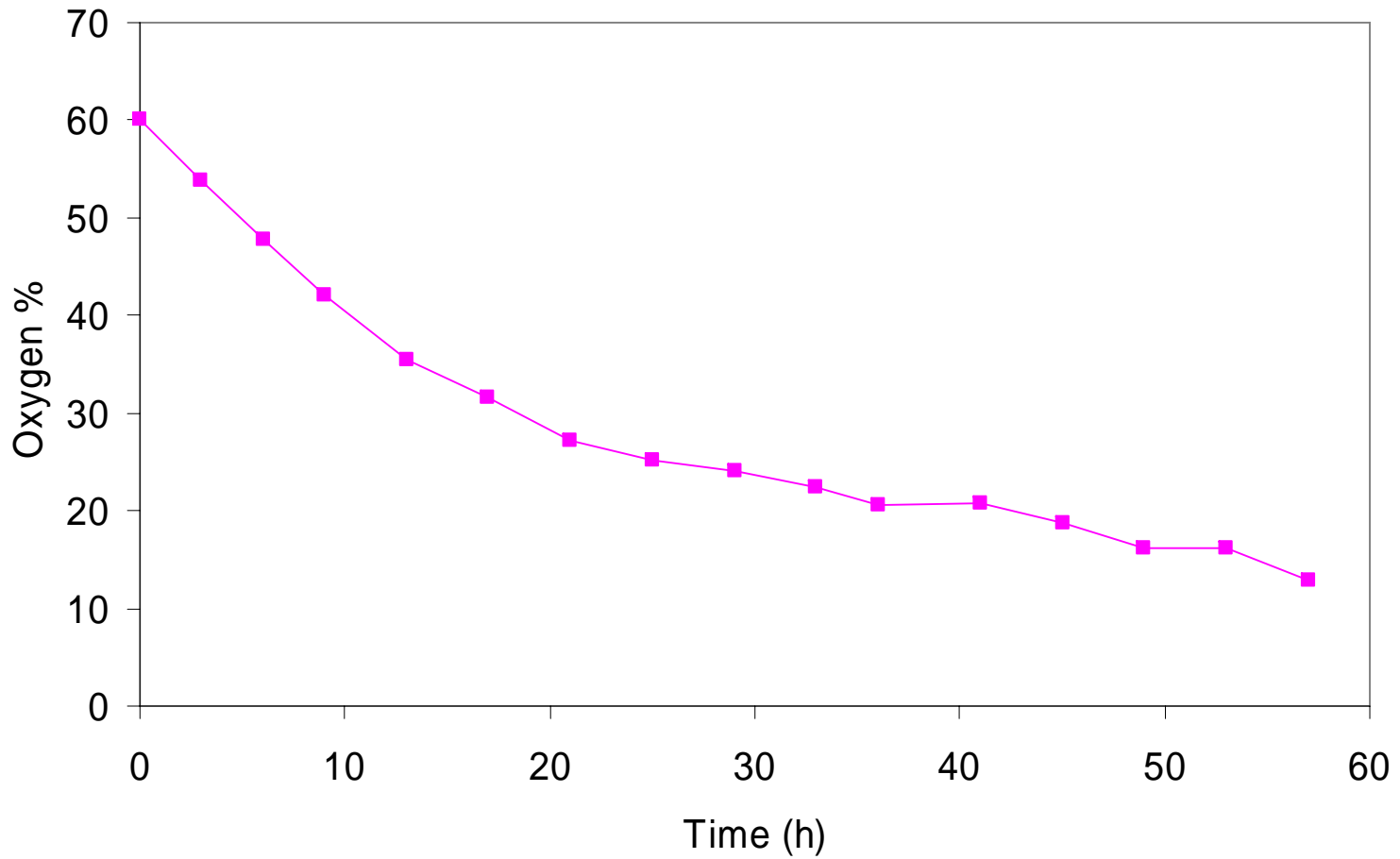
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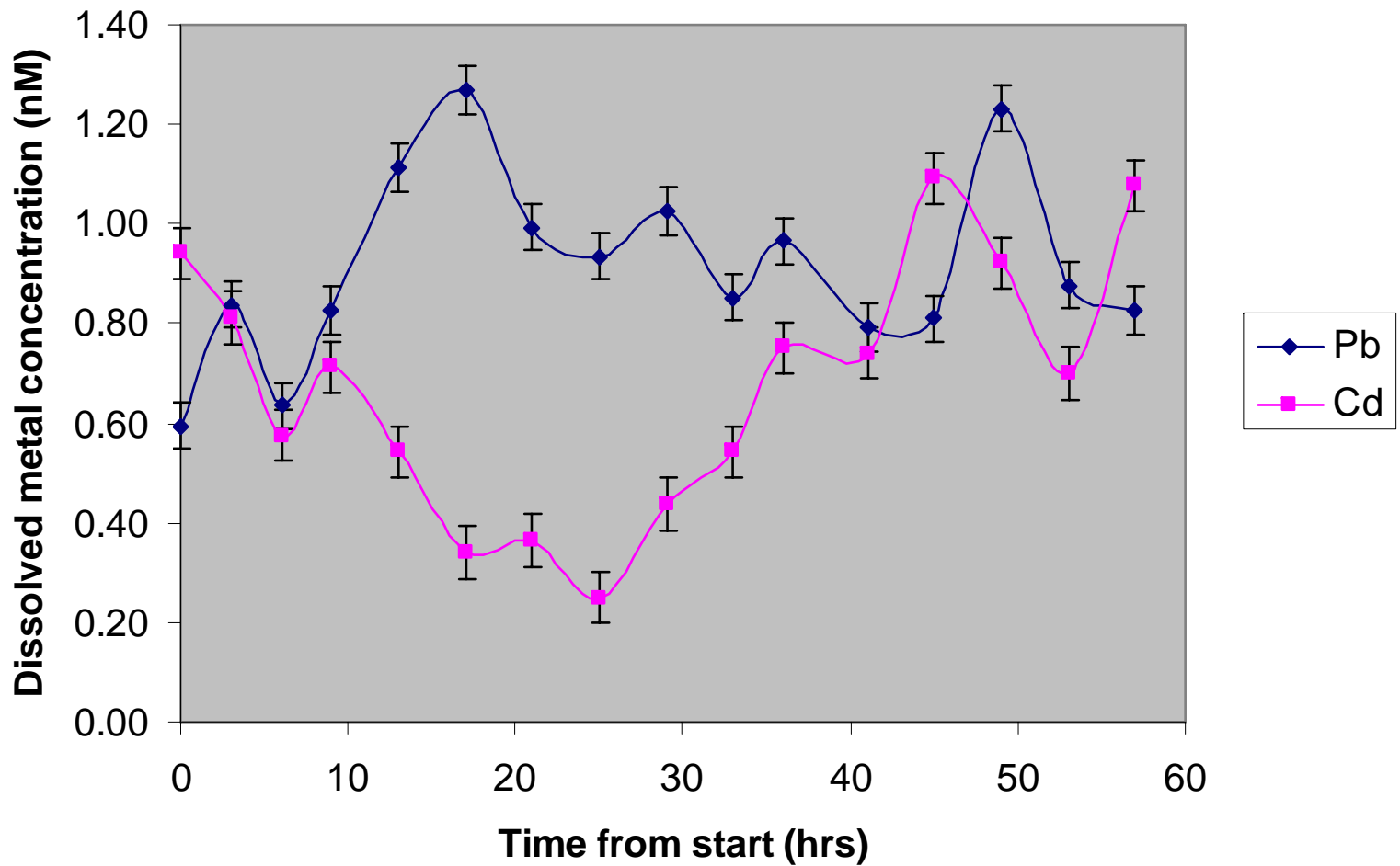
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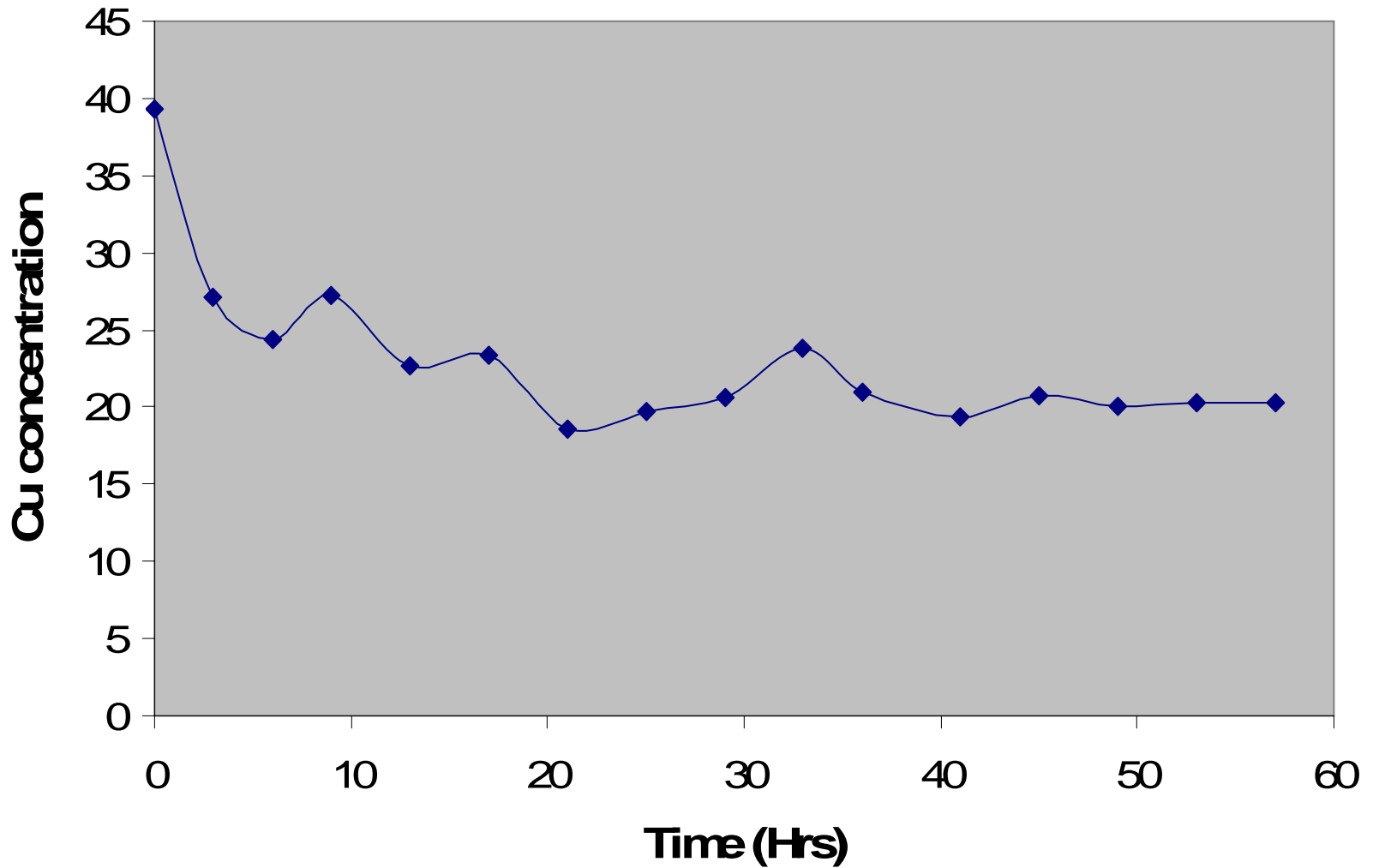
Dissolved oxygen in the benthic chamber

## Total dissolved metal concentration Venice Lagoon Trip 3

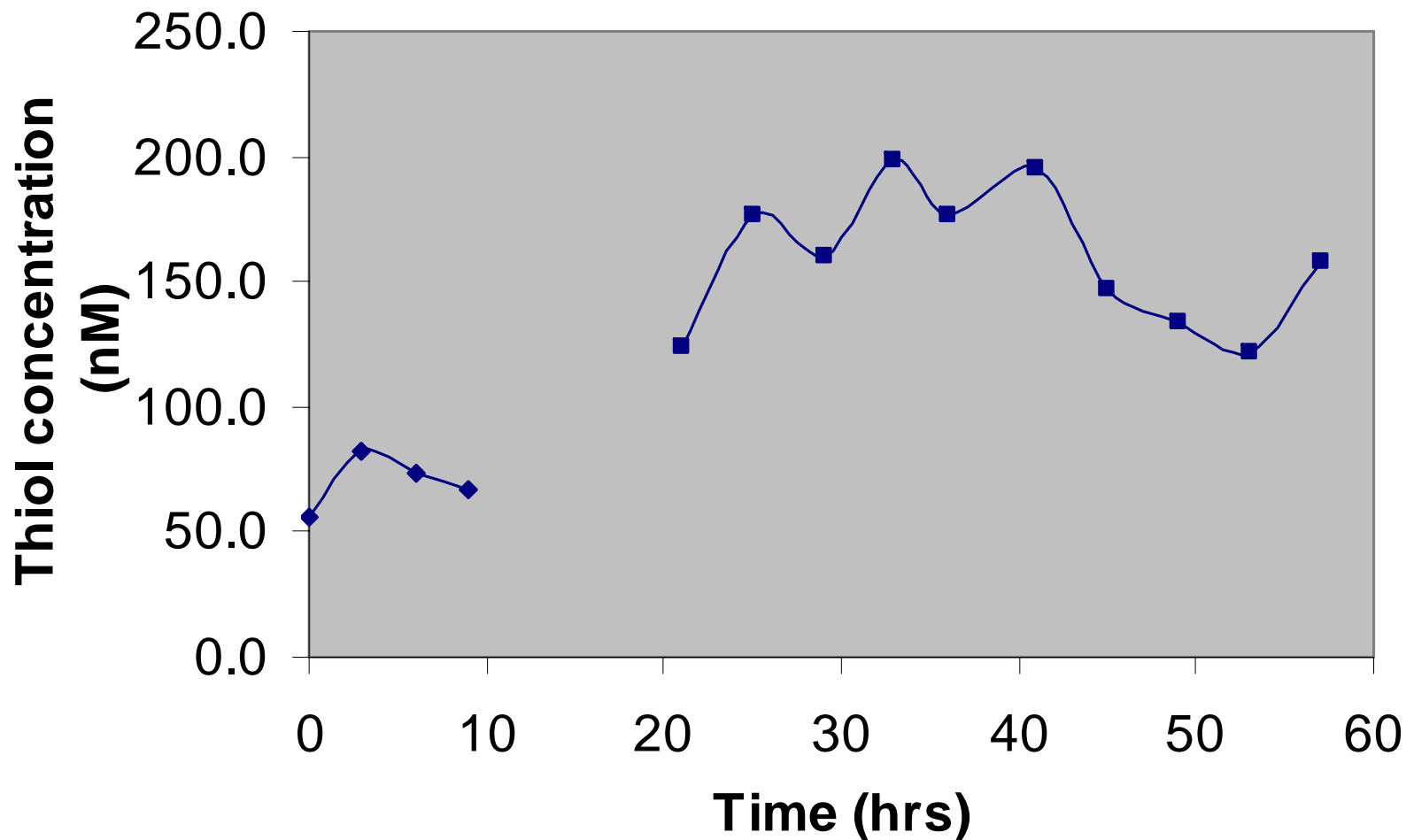


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- We are now preparing for in-situ measurements of sulphide, lead, manganese and oxygen, in a very small benthic chamber of a few ml, using small electrodes of 100  $\mu\text{m}$ .