

Site Characterization

Geochemical Characterization Methods



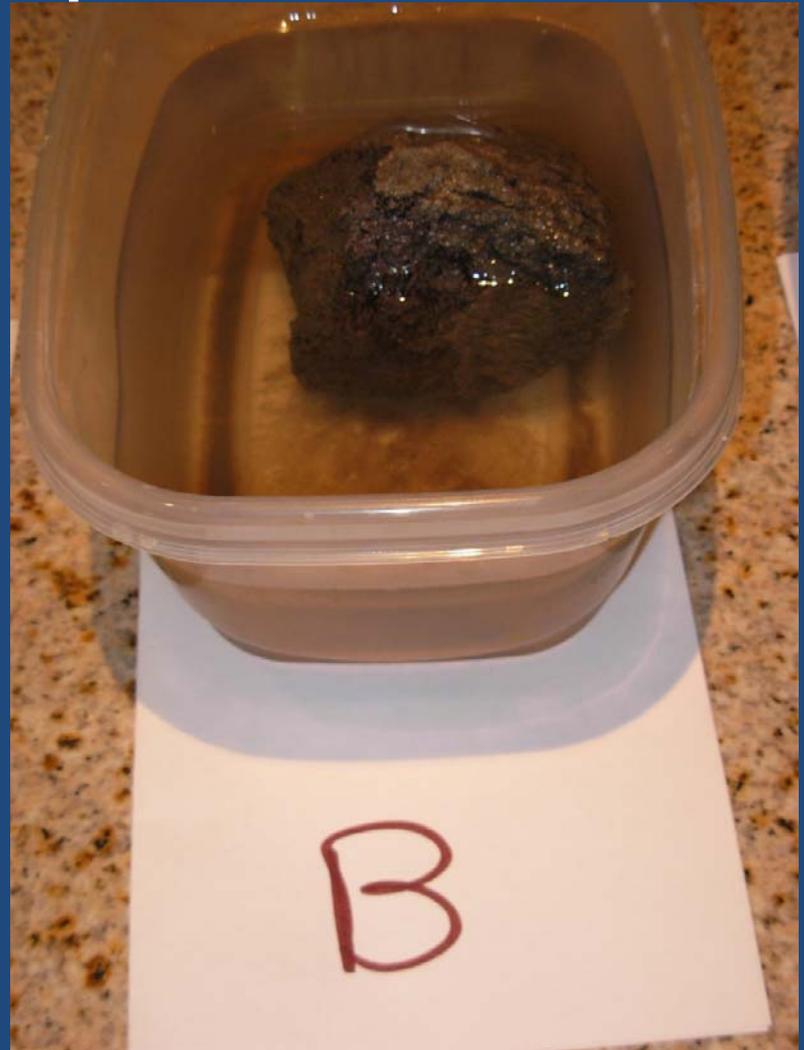
Guess the pH

5 containers with
rock and water



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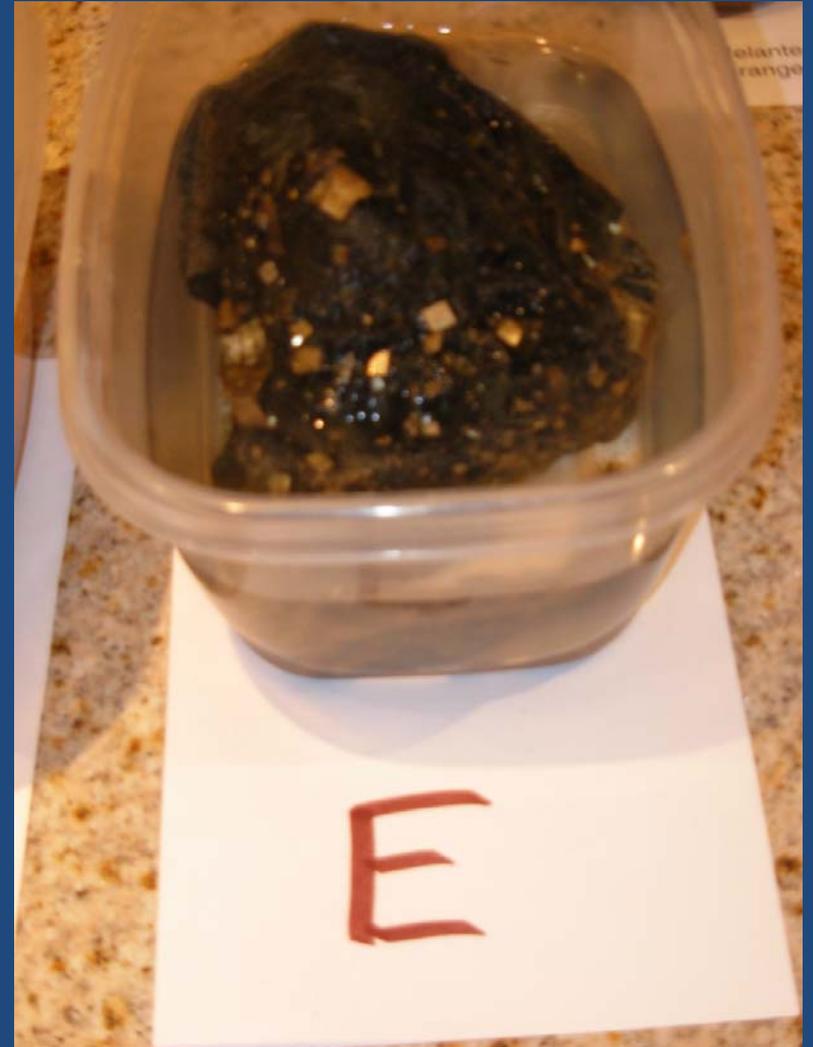
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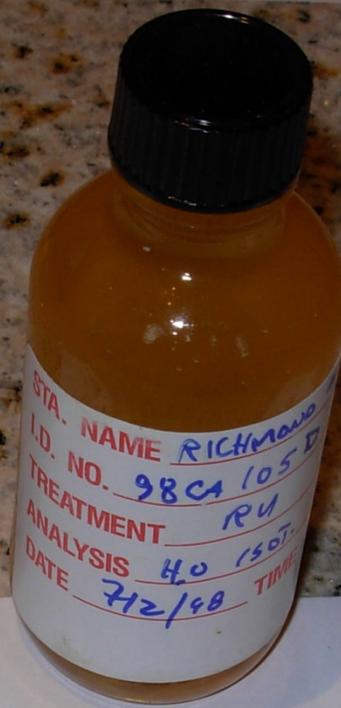


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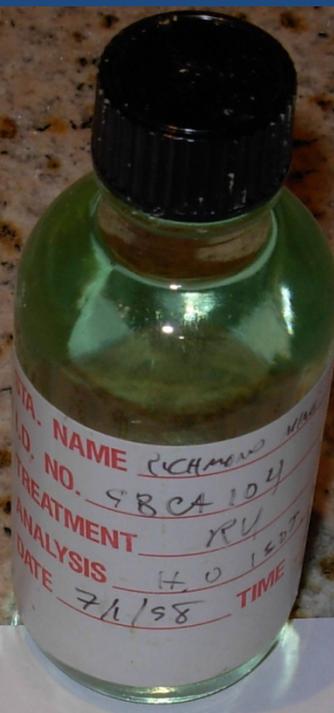
- Record your guesses on a plain piece of paper

	Estimated pH	Measured pH	Absolute Difference
• A	_____	_____	_____
• B	_____	_____	_____
• C	_____	_____	_____
• D	_____	_____	_____
• E	_____	_____	_____
	Total absolute difference		_____

Lowest score wins!

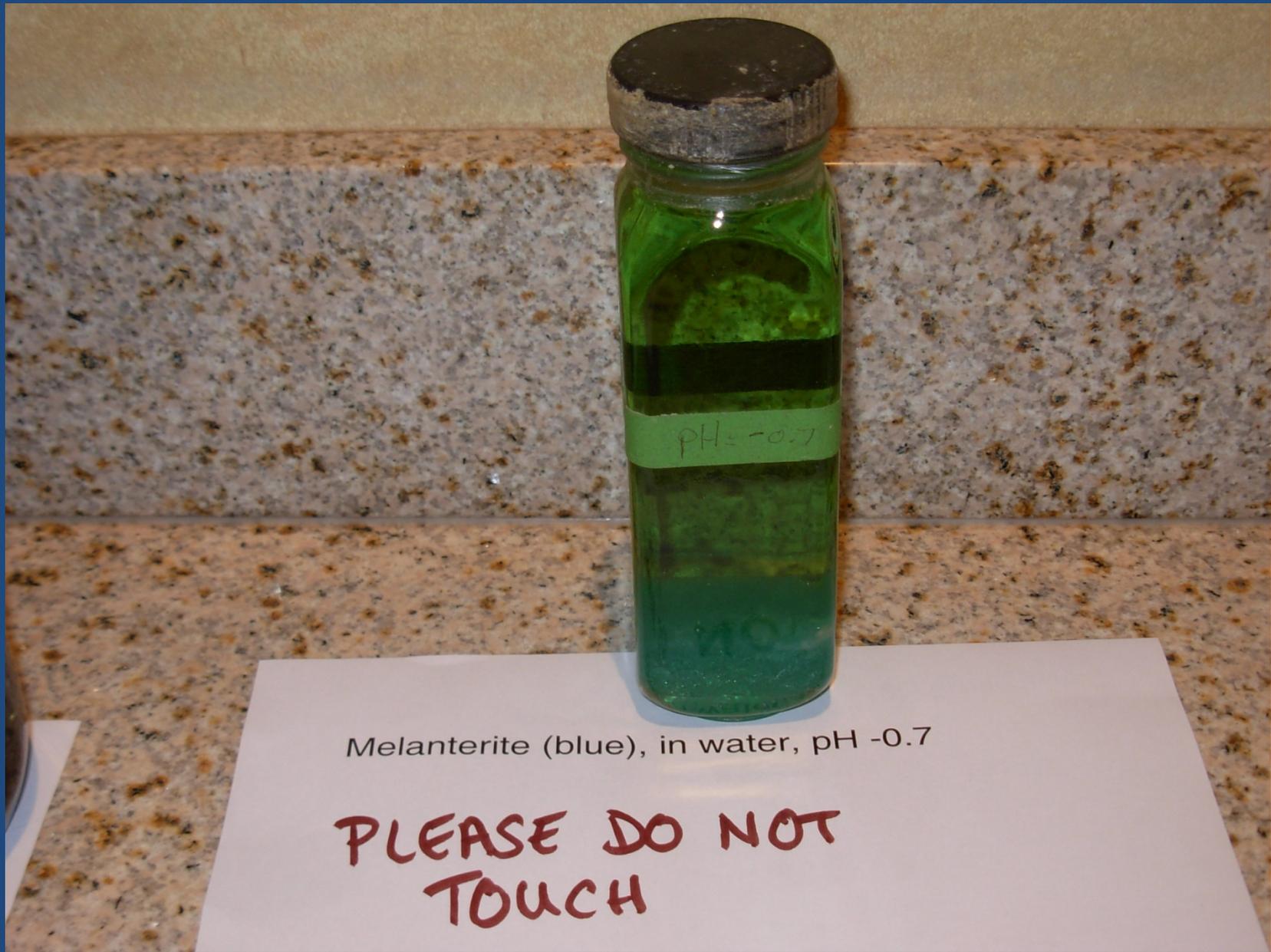


Water from A drift, Richmond Mine, pH 1.5
PLEASE DO NOT TOUCH



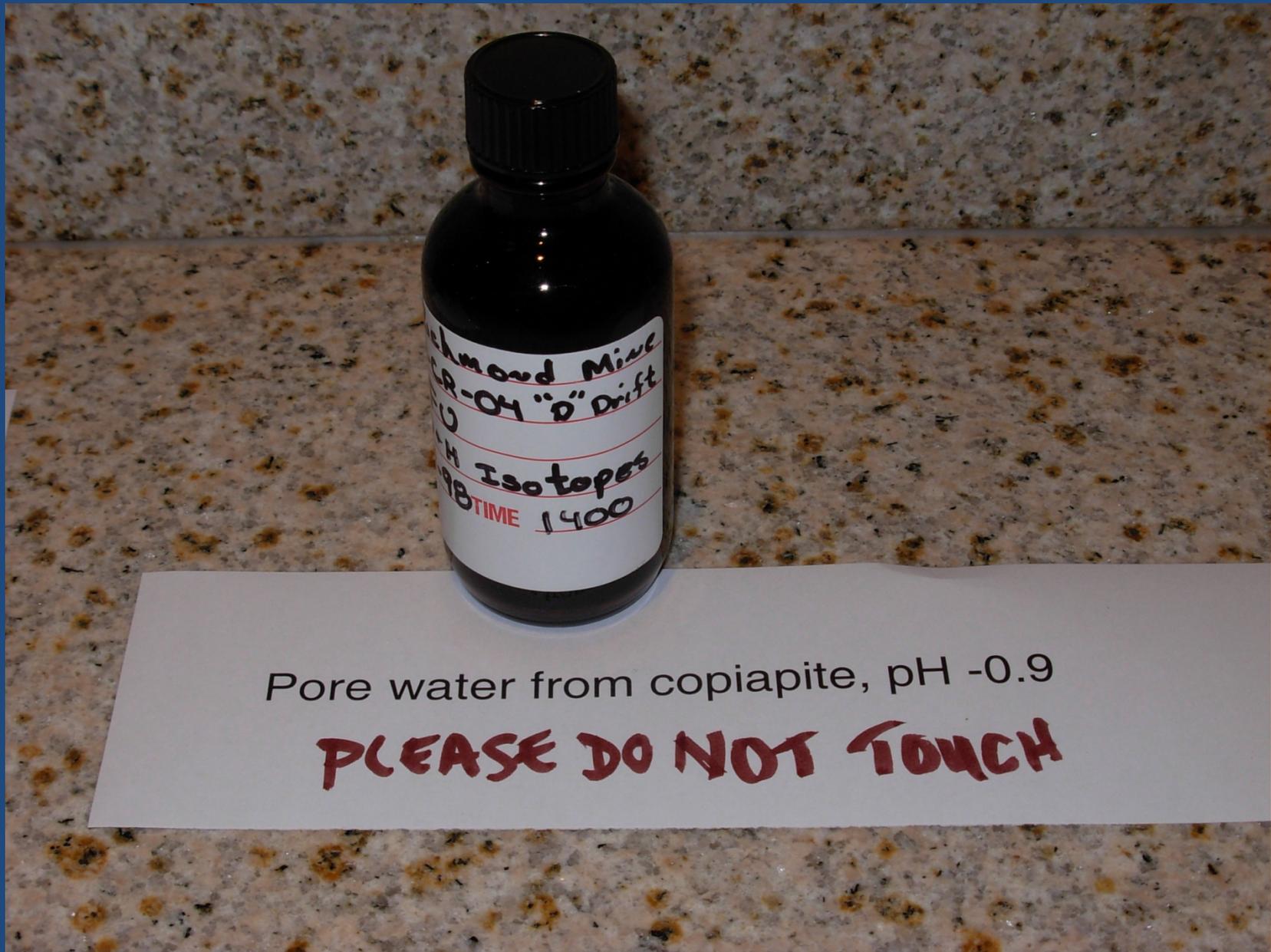
Water from B drift, Richmond Mine, pH 0.5

PLEASE DO NOT TOUCH



Melanterite (blue), in water, pH -0.7

PLEASE DO NOT
TOUCH



Pore water from copiapite, pH -0.9

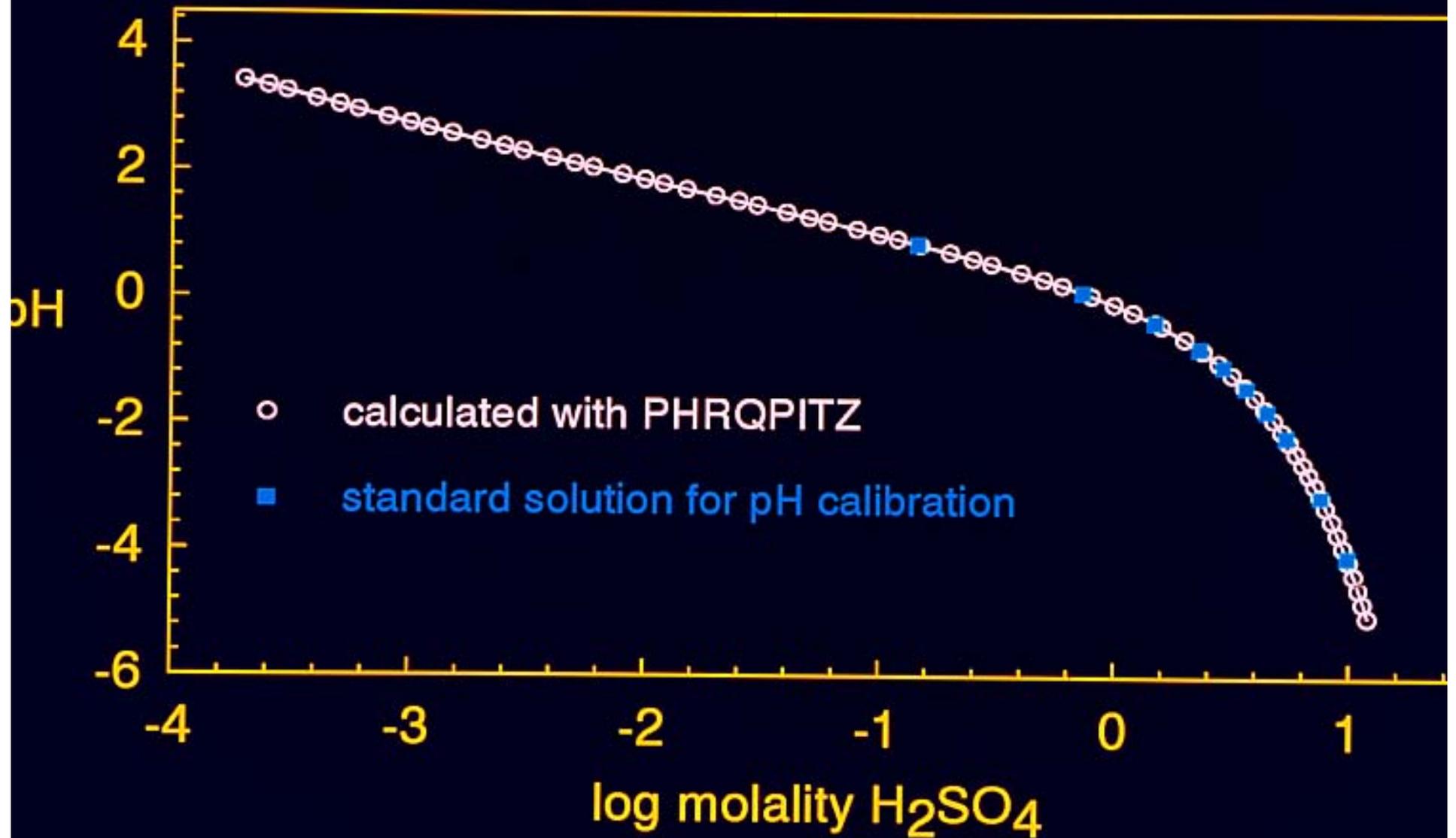
PLEASE DO NOT TOUCH



Copiapite with pore water, pH -0.9

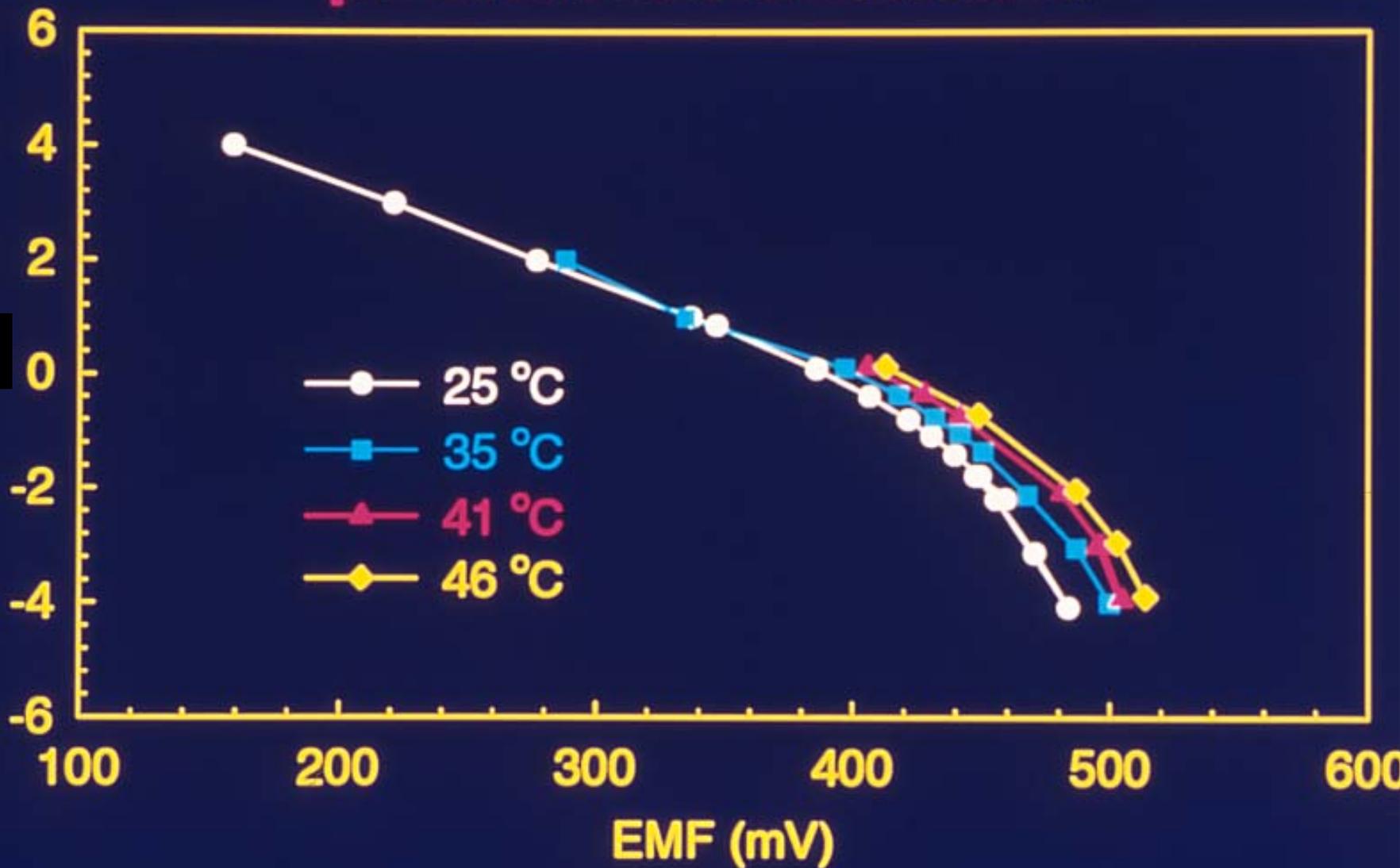
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Calculated pH vs. H₂SO₄ Concentration



pH Electrode Calibration

pH



$$\text{pH} = -\log a_{\text{H}^+}$$

$$a_{\text{H}^+} = m_{\text{H}^+} \gamma_{\text{H}^+}$$

(MacInnes Scaling)

pH	a_{H^+}	m_{H^+}	γ_{H^+}	$m_{\text{H}_2\text{SO}_4}$
7	10^{-7}	10^{-7}	1.0	--
3	.001	.001	.95	.0005
1	.10	.13	.77	.102
0	1.0	1.1	.94	.86
-1	10.	3.4	2.9	2.8
-3	1000.	7.9	125.	7.4

Values computed using PHRQPITZ (Plummer et al., 1988)