Dolphin

**Prompt 1**

“Welcome to the Ocean Laboratory, where the water is contaminated with lead (Pb). My name is Dolphi and I shall LEAD you through this treacherous land.”

**Prompt 2**

“Your journey will be difficult but thou shalt not fear as I shall be with you through this. Thou shall precipitate all the lead and liberate us aquatic creatures from this doom. “

**Prompt 3**

“Lead (Pb2+) the forsaken ion! Your task is to figure out how we could precipitate lead out of the solution.”

**Prompt 4**

“Remember this thing young one. All Nitrates are soluble. That can’t be the magic anion now, can it? \*\*sad dolphin noises\*\*

Pb2+ (aq) + 2NO3- (aq) ​→ Pb(NO3​)2 (aq)

**Prompt 5**

**“**The pH is low out here in these trenches. If only we could raise the pH or perhaps have some hydroxide ions. ti ti ti**”**

Pb²⁺ + **2OH⁻** → Pb(OH)₂(s) **See Research Below**

**Prompt 6**

Dolphin – “I am not usually salty but when I am, I precipitate Lead out of the solution. There goes your clue.”

Pb2+(aq) + 2Cl-(aq) PbCl2(s) **See Research Below**

**Prompt 7**

Dolphin – “It burns, but it turns, lead into white precipitate. See what I did there? Turr Turr”

Pb2+(aq) + SO42-(aq) 🡪 PbSO4(s) **See Research Below**

**RESEARCH**

Ways to Precipitate Lead (Pb2+) ions from water.

1. Using a caustic (highly basic) chemical to raise the pH of the solution so that the lead combines with the hydroxide ions in a basic environment and precipitates out of the solution. For example: **NaOH (Sodium Hydroxide)**

Pb²⁺ + **2OH⁻** → Pb(OH)₂ (s)

Lead hydroxide (Pb (OH)2) is precipitated out of solution as a white solid that is soluble in excess NaOH to give a colorless solution.

<https://www.sciencephoto.com/media/4343/view/lead-hydroxide-precipitate>

SAMPLE PROMPT

‘Warrior raises the pH, lead hydroxides are insoluble ti ti ti’

1. Lead (II) Chloride is insoluble in water. You can get chloride ion from NaCl or little bit of dilute HCl (Hydrochloric Acid)

Pb2+(aq) + 2Cl-(aq) 🡪 PbCl2(s)

<https://www.chemguide.co.uk/inorganic/group4/lead.html>

SAMPLE PROMPT

Dolphin – “Lead Chloride is insoluble in water. I am feeling salty. There goes your clue.”

1. Iodide(I) salts of Lead (Pb) are insoluble. KI (Potassium Iodide)

Pb2+ + KI 🡪 PbI(s)

1. Lead Sulphates are insoluble.

Sulphuric Acid (H2SO4) when lead reacts with this acid, the sulphates ions will react with lead ions to precipitate lead out of the solution.

Pb2+(aq) + SO42-(aq) 🡪 PbSO4(s)

SAMPLE PROMPT

Dolphin – “It burns, but it turns, lead into white precipitate. See what I did there? Turr Turr”

Audio

Search how a dolphin makes noises.