

# M ALKALINITY

## Determination of M Alkalinity Range 50 - 2400ppm (as CaCO<sub>3</sub>)

Notes	Health & Safety
Please read before proceeding with the test.	Refer to R & S phrases on individual bottles.
When performing the test hold the dropper bottles exactly upside down and allow drops to form slowly and fall off under their own weight.	Wear protective gloves and safety goggles when performing any tests using corrosive, harmful or irritant reagents.
Do not shake off drops as this will affect the accuracy of the test.	Do not ingest.

Take sample according to expected range.	Add drops of <b>TA4</b> to give a <b>blue</b> colour.	Count drops of <b>TA3</b> or <b>PA2/TA2</b> until <b>yellow/orange</b> .	Record Number of drops.
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Colours may vary depending on sample and test conditions.

**Total Alkalinity (as CaCO<sub>3</sub>) ppm = Number of Drops x Factor**

ppm = mg/l

Expected Range	Titrant Used	Sample Size	Factor
50 – 150	TA3	40ml	5
100 – 300	TA3	20ml	10
200 – 600	TA3	10ml	20
200 – 600	PA2/TA2	40ml	20
400 – 1200	PA2/TA2	20ml	40
800 – 2400	PA2/TA2	10ml	80

### NOTE

The M refers to methyl orange the indicator originally used for titrating Total Alkalinity. Nowadays 4.5 Indicator is used but the old M terminology has remained.

### Alkalinity Relationships

The separate contributions to alkalinity from free caustic, carbonate and bicarbonate can be estimated using the P & M alkalinity relationship table below.

if	OH	CO <sub>3</sub>	HCO <sub>3</sub>
<b>P = 0</b>	0	0	M
<b>P &lt; M/2</b>	0	2P	M – 2P
<b>P = M/2</b>	0	2P	0
<b>P &gt; M/2</b>	2P – M	2 (M – P)	0
<b>P = M</b>	M	0	0

# P ALKALINITY

## Determination of P Alkalinity Range 50 - 2400ppm (as CaCO<sub>3</sub>)

Notes	Health & Safety
Please read before proceeding with the test.	Refer to R & S phrases on individual bottles.
When performing the test hold the dropper bottles exactly upside down and allow drops to form slowly and fall off under their own weight.	Wear protective gloves and safety goggles when performing any tests using corrosive, harmful or irritant reagents.
Do not shake off drops as this will affect the accuracy of the test.	Do not ingest.

Take sample according to expected range.	Add <b>3 drops of PA1</b> If sample does not turn pink, P Alk. = 0ppm.	Count drops of <b>TA3</b> or <b>PA2/TA2</b> until sample just turns <b>clear.</b>	Record Number of drops.
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Colours may vary depending on sample and test conditions.

**P Alkalinity (as CaCO<sub>3</sub>) ppm = Number of Drops x Factor**

ppm = mg/l

Expected Range	Titrant Used	Sample Size	Factor
50 – 150	TA3	40ml	5
100 – 300	TA3	20ml	10
200 – 600	TA3	10ml	20
200 – 600	PA2/TA2	40ml	20
400 – 1200	PA2/TA2	20ml	40
800 – 2400	PA2/TA2	10ml	80

### NOTE

The P refers to phenolphthalein the indicator originally used for titrating P Alkalinity. The colour change occurs at pH 8.3.

### Alkalinity Relationships

The separate contributions to alkalinity from free caustic, carbonate and bicarbonate can be estimated using the P & M alkalinity relationship table below.

If	OH	CO <sub>3</sub>	HCO <sub>3</sub>
<b>P = 0</b>	0	0	M
<b>P &lt; M/2</b>	0	2P	M – 2P
<b>P = M/2</b>	0	2P	0
<b>P &gt; M/2</b>	2P – M	2 (M – P)	0
<b>P = M</b>	M	0	0