1. REFERENCE

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2. PRINCIPLE

The following work instruction provides information about the processes of testing the P-available soil content by the Olsen method and how to calculate the test results.

3. BASE OF DETERMINATION

Phosphate in the soil's neutral/alkaline atmosphere will be bound as Ca, Mg-PO4. NaHCO3 extractor will precipitate Ca, Mg-CO3 so that PO3- is released into solution. This extractor can also be used for acid soils. Phosphate in acid soils is bound as Fe and Al-phosphate. Adding NaHCO3 extractor pH 8.5 causes the formation of Fe, Al-hydroxide, so that phosphate is liberated. This extractor is usually used for soils with a pH of

4. TOOLS

- 50 ml shake bottle
- W 91 filter paper
- Test tube
- 2 ml pipette

- 20 ml dispenser
- 10 ml dispenser
- Horizontal Shaker
- UV-VIS spectrophotometer
- Analytical balance

5. REACTION

- **0.5 M NaHCO3 extractor, pH 8.5**

  Dissolve 42.0 g NaHCO3 in 1 liter of deionized water. Add NaOH to set the pH of the solution to 8.5, if necessary.

- **Concentrated reagent P**

  Dissolve 12 g (NH4)6 Mo7O24.4H2O with 100 ml deionized water in a 1 l volumetric flask. Add 0.277 g K(SbO)C4H4O6 0.5 H2O and slowly add 140 ml concentrated H2SO4, swirl it until homogeneous. Add deionized water until 1 L mark.

- **Coloring reagent P**

  Mix 1.06 g ascorbic acid with 100 ml concentrated reagent P. Add 25 ml of 4N H2SO4, then make 1 l with deionized water. This P reagent should always be made fresh.

- **Standart 1,000 ppm PO4 (Titrisol)**

  Quantitatively transfer the PO4 Titrisol standard solution into a 1-liter volumetric flask. Impound with deionized water up to the line mark and swirl until it homogeneous.

- **Standard 100 ppm PO4**

  Pipette 10 ml of 1,000 ppm PO4 standard solution into a 100 ml flask. Impound with deionized water up to the line mark and swirl until homogeneous.

- **Standard sequence PO4 (0-20 ppm)**

  Pipette respectively 0, 2, 4, 8, 12, 16, and 20 ml of 100 ppm PO4 standard solution into a 100 ml volumetric flask, diluted with Olsen reagent to 100 ml.

6. HOW TO WORK

Weigh 1,000 g of <2 mm soil sample, put it into a shaking bottle, add 20 ml of Olsen reagent, then shake for 30 minutes. Filter it using filter paper, and if the extract turns out cloudy, filter the extract again. The extract and standard solution series were pipetted 2 ml into the test tube and add 10 ml of phosphate coloring reagent, mix it using the vortex until homogeneous and let it sit for 30 minutes. The absorbance of the solution was measured with a spectrophotometer at a wavelength of 889 nm.

7. CALCULATIONS

Available P2O5 content (ppm)

= ppm-curve x ml extract/1,000 ml x 1,000 g/g sample x fp x 142/90 x fk

= ppm-curve x 20/1,000 x 1,000/1 x 142/90 x fk

= ppm-curve x 20 x 142/90 x fk

Description:

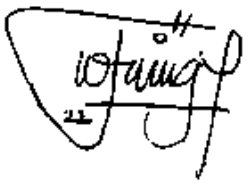
ppm curve = sample content obtained from the relationship curve between the levels of the standard series with its reading after the corrected blank.

Fp = dilution factor (if any)

142/190 = PO4 to P2O5 form conversion factor

Fk = moisture correction factor = 100/(100 - % moisture content)

Appendix

Prepared by :	Authorized by :
	
Wiga Fikri Destianisma, S.P.	Ir. Siswanto, M.P