

SELECTION CRITERIA TOOL

by:

Susila Kristianingrum

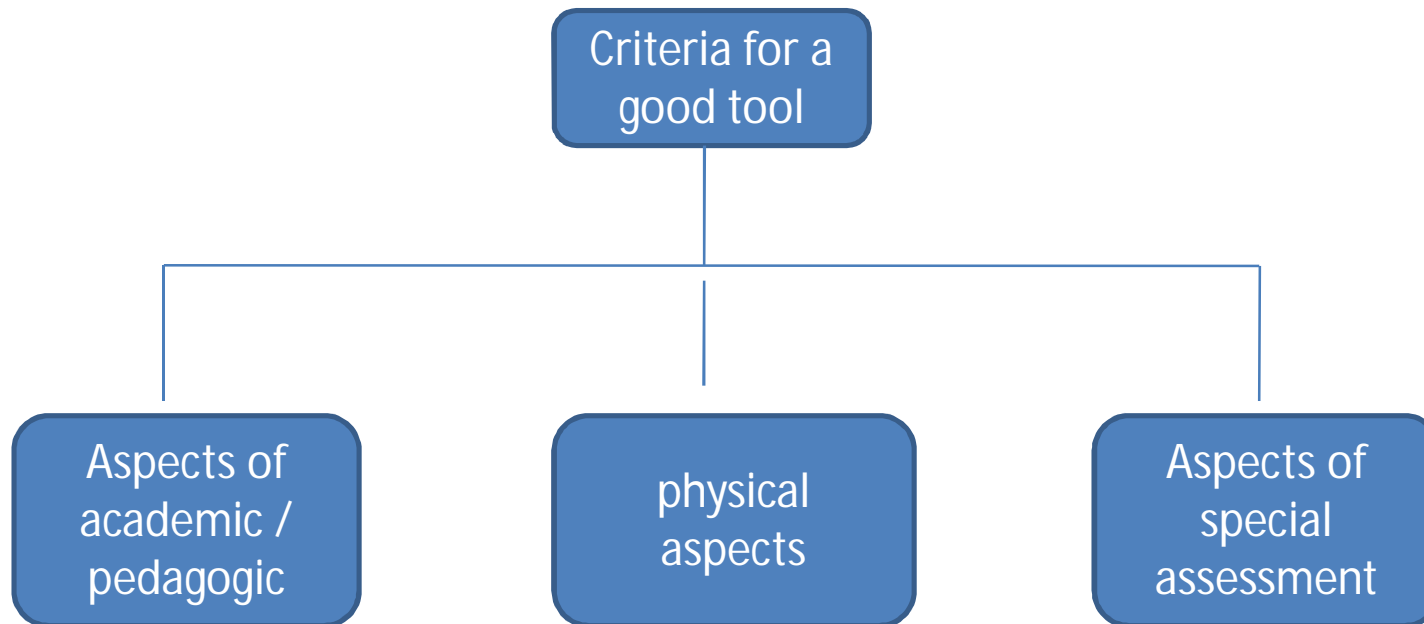
susila.k@uny.ac.id

Basic competency:

Students can describe the criteria for
a good tool as needed

Choosing the right tool in the procurement of equipment

- How to choose a good / correct as needed and funds are available?

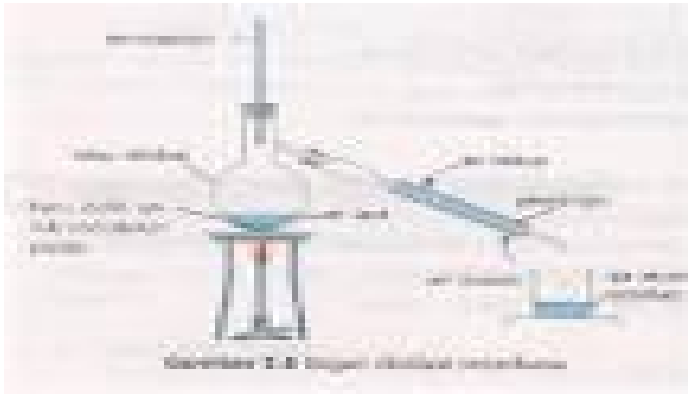


Aspects of academic / pedagogic

Can be used for:

1. Instilling the concept of an existing chemical
2. Reveals a new concept of chemical
3. Stimulate students' thinking to construct a generalization
4. Accelerate the learning process of children
5. Accelerate the learning process

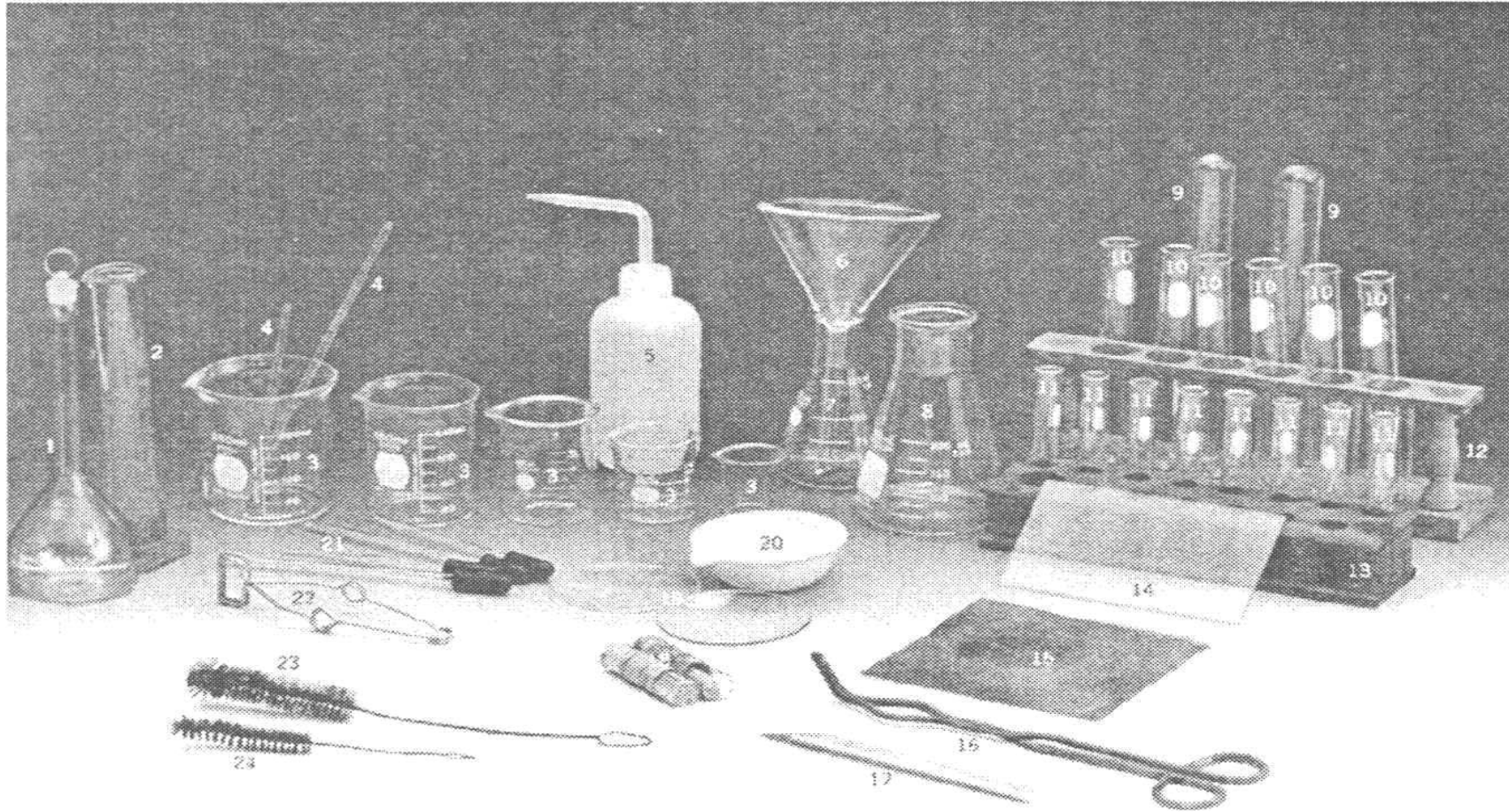
Steam distillation



Vacuum distillation & AAS (Atomic Absorption Spectrophotometer)



Glassware



Physical aspects

- Usability of the tool
- structure tool
- reliability tools
- material tool
- size of tool
- shape tool
- practicality tools
- value reparations
- user safety

Usability of the tool

- The tool can be used for several types of experiments, several laboratories
- pHmeter



pH Meter (Orion 3 Star) and pH Combination Electrode Calibration

Procedure:

Note: The pH meter and pH combination electrode must be calibrated each day before use.

The ATC probe must be used during calibration of the pH probe and during pH measurement of samples.

1. Bring the temperature of the pH buffers and samples to room temperature before beginning calibration procedure. All solution temperatures should be within ± 3 °C of room temperature.
2. Follow the calibration instructions for the Orion 3 Star meter and pH combination electrode being used (see “ Orion 3 Star Meter User Guide pp.19-20”).

PROCEDURE

pH Meter (Orion 3 Star) and pH Combination Electrode Calibration

3. Press the **ON/OFF** button to turn the meter on. To set the pH meter parameters press the **Setup** button. Press the **Line Select** button and use the down arrow key to change the display to **bUF**. Press the **Line Select** key again to accept the selection and move to the next line. The third line should display **USA**. If not, use the up and down arrow keys until **USA** is displayed. Press the **Line Select** key once more to accept that selection. Press the **Measure** key.
4. To calibrate the pH meter and electrode while in the measurement mode, press the up arrow key until the pH icon is displayed on the right side of the display. Then press the **Calibrate** key to begin the calibration process. The meter will display **CAL.1** on bottom display line.

PROCEDURE

pH Meter (Orion 3 Star) and pH Combination Electrode Calibration

5. Begin calibration by removing the pH electrode from the storage solution, removing the plug from hole for the internal filling solution, rinsing the electrodes (pH and ATC) with deionized water and blotting dry with a Kimwipe®.
6. Place the electrodes into the bottle containing the pH4.00 buffer and a stir bar. Stir at a slow speed. When the meter indicates that a stable reading has been obtained for the pH 4.00 buffer (pH icon stops blinking), press the **Calibrate button on the meter.** **The meter will display CAL.2 on bottom display line.**

PROCEDURE

pH Meter (Orion 3 Star) and pH Combination Electrode Calibration

7. Remove the electrodes from the buffer, rinse with deionized water and blot dry.
8. Repeat steps 6 and 7 for the pH 7.00 and 10.00 buffers. After the pH 10.00 buffer has been used for the calibration and the “pH icon” stops flashing, press the **Measurement** key to save and end the calibration. The meter will display the electrode slope. This should be recorded in an equipment- or project-specific notebook. The slope should be between 92 % and 102 %. If the slope is not in this range, the calibration procedure should be repeated.

The simplicity of form / structure

- Form a simple tool / not complicated
- Facilitate the process of data collection
facilitate the use
- Example: measurement of soil pH with universal indicator paper or a "set of soil analysis" is not to be calibrated pHmeter

Reliability

Reliable tool if:

Can be used by anyone, anywhere, with similar results

Terms: easy to read scale

Measuring instruments: volume, mass, pressure

Quality materials

- Good tools are made of quality materials which are not easily damaged
example:
Glass pyrex or Jena
Corrosion resistant metal

Size of tool

Depending on the intended use of the tool for:
practicum
demonstration
research

Performance / forms

The shape is interesting and subtle

no rough

The surface of flat glass tools

Practicality

Easily stored and transported so as not to fast damaged

Example: - Kit tools



Repair

- Ease of repair, do not continue to waste disposable
- For example:
Power supply
pHmeter

Security

- Aid wearer safety is assured
- Not easy to pose a hazard
- Not easy to cause damage to the tool itself

Aspects of special assessment

- sensitivity:
Gauge the influence of something known factors (temperature, humidity, pressure, wind) to change the appointment is to have
- high sensitivity
- availability of stock
- Thoroughness
- Partner

Assessment of an instrument table

Aspect					weight	Sum	infor mati on
	1	2	3	4	value	value	
Akademic					5		
Usability of the tool					4		
The simplicity of form / structure					4		
Reliability					1		
Quality materials					2		
Size of tool					3		
Performance/ forms					1		
Practicality					2		
Repair					1		
Security					2		

Examples of circumstances gauges offered

specification	Volumetric glass A	Volumetric glass B	Volumetric glass C
Size	100 ml	100 ml	100 ml
Material	pyrex	natron	Jena
Scale/table	etched / painted	painted	etched
Diameter	3 ml	5 ml	5 ml
Dasar alat	glass	Glass & plastic	glass
Price (Rp)	30.000	20.000	25.000

Examples of the tool table A, B, and C

No	Value	Value	Value	weight	Σ	Σ	Σ	Infor mation	
Aspect	A	B	C	Value	A	B	C		
1				5					
2				4					
3				4					
4				1					
5				2					
6				3					
7				1					
8				2					
9				1					

Provision

- Range of values 1-4
- 1 : minimum value
- 4 : maximum value
- Total weight value = 25
- Total maximum value = $4 \times 25 = 100$
- Maximum figure for the best tool = 100 (the maximum eligible)

Determination of purchase

	Total value	Price
A	85	30.000
B	70	20.000
C	80	25.000

Terms of the value of at least 60

- Means that all eligible
- Which has a reasonable price?

Example Ranking Reasonable

	Value	Price (Rp)	Conversion Price	Ranking reasonable
A	85	30.000	$85/85 \times 30.000$	30.000 (3)
B	70	20.000	$85/70 \times 20.000$	24.285 (1)
C	80	25.000	$85/80 \times 25.000$	26.562 (2)

Tools purchased are B

The reason:

1. Once converted it turns out the most reasonable price is worth 85 B because if the price is 24 285 (bid of Rp 20,000)
2. So even though the B value is only 70, but has been qualified and the lowest conversion price (cheap