

The DP-AC was found to be an excellent adsorbent, and complete removal was almost reached for Pb and Zn. Although the removal of other elements was less, the removal percentage was always above 30%.

One of the most important properties of transformer oil is its breakeven voltage, which is defined as the minimum applied voltage that would cause a given insulator to break down. According to the International Electrotechnical Commission standards, the breakeven voltage of the transformer oil should not be less than 30 kV. As shown in Table 1, after contacting the aged oil with DP-AC for 24 hours, the breakeven voltage of the aged oil increased from 20 to 30 kV, which is a clear indication of the applicability of DP-AC as a regeneration adsorbent. Table 1 also shows comparison between other physical and chemical properties of the aged and regenerated oils compared to the standard values of the International Electrotechnical Commission. The results clearly show that the regenerated oil has acceptable levels of viscosity, density, interfacial tension and breakeven voltage. The only unacceptable value was the neutralization index, which the DP-AC although managed to decrease it by 66%, yet did not reach the acceptable level, but approached it significantly though. The results found in this work show the ability of the DP-AC to be used as an adsorbent for transformer oil regeneration.

4. Conclusion

Activated Carbon (AC) was produced from date-pits, which is considered an agricultural waste, and used as an adsorbent in transformer oil regeneration. Measurement of the relevant physical and chemical properties of the aged oil before regeneration and those of the regenerated oil showed that the regenerated oil has acceptable levels of viscosity, density, interfacial tension and breakeven voltage, whereas the neutralization index although significantly approached the acceptable level, dropping by 68%, it did not reach it. The results found in this work show the ability of the DP-AC to be used as an adsorbent for transformer oil regeneration.

5. References

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