

UDC 537684; 608.4

Distillation, an effective process for water purification

Rouaiguia I.¹, Hamdi B.², Benselhoub A.^{3*}, Trirat T.³, & Makhlouf A.⁴¹National Higher School of Technology and Engineering, Department of Mining, Metallurgy and Materials Engineering, Annaba, 23000, Algeria²Mohamed Cherif Messaadia University, Department of Material Science, Souk Ahras, 41000, Algeria³Environmental Research Center (C.R.E), Annaba, 23000, Algeria, *e-mail:benselhoub@yahoo.fr⁴Geological Sciences Department, FSBSA, Mouloud Mammeri University of Tizi-Ouzou, PB N° 17 RP15000 Tizi Ouzou, Algeria

Purpose. We all agree on the principle that water is life. Noting that, obtaining drinking water that meets the World Health Organization standard is a difficult and sometimes expensive process. The main objective of this research work is separation of constituents from a mixture of solution in the first instance and our tendency is water purification in the other side. **Methods.** Given that the purification of solutions represents a major challenge for them, based on basic knowledge of the chemistry of solutions. We have conducted some separation tests in the laboratory with the aim of eliminating harmful elements. For this reason, a comparative study was carried out on two different separation techniques in a water-ethanol solution of 10 ml. In the first one, a simple distillation test was carried out at a temperature above than 78.5°C and at a

low pressure from which only 0.6 ml of distillate (ethanol) was recovered (too low yield). However, in the second experimental protocol three assays were conducted using a distillation column with different volumes of water-ethanol mixture. The varieties of parameters and experimental protocols carried out with well-defined objectives and direct impacts on the results obtained. **Results.** Overall, we can say that the results obtained are clear and significant. In addition, the tests carried out made it possible to obtain satisfactory results in terms of yield and purification. Furthermore, the best results were obtained in the solution of 6 ml ethanol and 4 ml water with Distillate = 6 ml and Residue = 0 ml (maximum recovery of ethanol from the solution). This is the reason why distillation is the best technique for separation, purification and extraction from the solution mixture. **Conclusions.** From the assembled results we can conclude that the distillation is a one of the best separation methods commonly employed, simple distillation (with simple separation apparatus design), by principle and methodology, is applied only if the boiling points of the constituents are different, in the opposite case; fractional distillation process (devices with complex, precise and critical components) is highly recommended.

Keywords: distillation; ebullition point; ethanol; purification; water.

Issam Rouaiguia

<https://orcid.org/0000-0002-9744-4219>

Basma Hamdi

<https://orcid.org/0000-0001-8881-7274>

Aissa Benselhoub

<https://orcid.org/0000-0001-5891-2860>

Tabet Trirat

<https://orcid.org/0009-0004-5080-8304>

Ali Makhlouf

<https://orcid.org/0000-0002-9505-4364>

УДК 633.367:631.53.04:631.816.1

Аналіз врожайності та адаптивних властивостей сортів кукурудзи звичайної в різних агрокліматичних зонах України

Руденко О. А.*, Таганцова М. М., Баліцька Л. М., Свиначук О. В.

Український інститут експертизи сортів рослин, вул. Горіхуватський шлях, 15, м. Київ, 03041, Україна, *e-mail: psp.uiesr@gmail.com

Мета. Дослідити врожайність та адаптивні властивості сортів кукурудзи звичайної (*Zea mays* L.) в умовах Степу, Лісостепу та Полісся

України з метою визначення найбільш продуктивних та стійких до агрокліматичних умов сортів для забезпечення стабільного та високого рівня врожайності. Вивчити особливості сортів кукурудзи звичайної, що внесені до Державного реєстру сортів рослин, придатних для поширення в Україні, та провести аналіз їхнього сортового потенціалу на підставі результатів кваліфікаційної експертизи. **Методи.** Польовий, ла-

Olexand Rudenko

<https://orcid.org/0000-0002-1928-2832>

Maryna Tagantsova

<https://orcid.org/0000-0003-3737-6477>