



## Research Article

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### Analysis of PTE Accumulation, Oil and Processed Products

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**Abstract:** The objective of the paper is to figure out what are **COMPOSITION - Biotoxic activity and toxic PTEs and Issues of Environment effects.**

By using descriptive method for primary model, synthesis methods and process analysis and analysis of difficulties and discussion, we have already noted that in various geological, geochemical and geostructural conditions there are different associations of potentially toxic elements-impurities in hydrocarbons. And Zones of entry of such biotoxicants into the environment located directly near fuel and energy facilities processing and consuming hydrocarbons raw materials, mainly fuel oils enriched with metals. Propagation range and levels atmospheric pollution depend on the power of the source, emission conditions, time impact, meteorological, climatic, relief and other conditions.

**Keywords:** Divorce, Causes, Effect, Compensation, Arbitrariness.

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## INTRODUCTION

With a relatively small distance, for example, in suburban areas adjacent to large thermal power plants areas of agriculture, there is a change in the share of environmental pollution with metals toxicants from aerosol to wastewater and waste accumulated in landfills, ash dumps etc. The highest concentration activity in water bodies in relation to metals biotoxicants, in descending order: suspended matter, bottom sediments, plankton, immobile and sedentary benthos, fish and birds feeding on aquatic biota.

For the purposes of the study, metals are of interest in significant quantities found in natural hydrocarbon raw materials and posing a serious danger to the environment.

Anomalous contents of V and a number of other metals are known in the Pudozhgorsk area (Karelia) and Kachkanar (Urals). On the Onega Peninsula in the Medvezhyegorsk region in the 80s in the largest vanadium-uranium deposit was discovered in the basement rocks, relating to uranium reserves (but not standards) to the 5 largest deposits in the world.

The paper presents related studies and **analysis with COMPOSITION - Biotoxic activity and toxic PTEs and Issues of Environment effects.**

## Research Questions

Question 1: What are related researches and what are **COMPOSITION - Biotoxic activity and toxic PTEs and Issues of Environment effects?**

## METHODOLOGY

Authors have used qualitative and analytical methods, descriptive method for primary model, synthesis and discussion methods in this paper.

We also used historical materialism method.

## MAIN FINDINGS

Analysis of key issue:

First, the process is relatively obvious and associated with the processing and disposal of oil. Table below lists individual examples of metal concentration in products derived from heavy sour oil specific deposits. As can be seen, the concentration coefficient of metals at the final the stage of oil processing - coke for the Usinsk field reaches 12.8. Metal Concentration in Products Derived from Heavy Sour Oil. It has already been emphasized above that the most toxic PTEs are in the form of sulfur connections. The formation of PTE can occur directly in humid air.

**Table 1.** Metal Concentration in Products Derived from Heavy Sour Oil

Deposit, characteristics of raw materials and distillation products	Density, t/m <sup>3</sup>	Content		
		S, %	V2O5, g/t	Ni, g/t
<b>Karazhanbas (Mangyshlak):</b>				
raw oil	0.939	1.5	295	-
tar	0.989	2.9	554	-
coke	-	4.2	2358	-
<b>Arian (Ural-Volga region):</b>				
raw oil	0.891	3.04	268	-
tar	-	4.40	429	-
coke	-	5.0	2429	-
<b>Ubinskoye (GPP), y1+y2:</b>				
raw oil	0.942	2.5	132	42
fuel oil (over 450°y)	-	-	299	89
coke	-	-	1687	638
<b>Yaregskoye (CCI):</b>				
raw oil	0.948	1.09	80	-
fuel oil (over 450°C)	1.022	1.36	164	-
coke	-	2.6	236	-

It has already been emphasized above that the most toxic PTEs are in the form of sulfur connections. The formation of PTE can occur directly in humid air.

The environment surrounding TPP, fly ash microparticles and significant volumes, released into the atmosphere during the combustion of sulfurous coals or fuel oils. For example, a thermal power plant with an average capacity for coal of 2 million tons /

year, with a content of 2% sulfur in coal, they are emitted into the air at least 80 thousand tons. As a result, not only “sour” rains fall on the soil, but also sulfur and oxide PTE compounds present in fuel, Table 2. Environmentally heavy meteorological situations during smog in urban agglomerations and industrialized regions is a direct consequence of these processes.

**Table 2.** Comparative toxicological characteristics of the metals that make up the volatile ash (mg/kg)

Dose	Fe	FeSO4	Fe(NO3)2	Cr	Cr2(SO4)2	K2Cr2O7	fly ash sample
MPD	1100	-	-	-	fifty	ten	7
LD50	2200	35	-	-	200	442	55
LD100	3200	50	-	-	1000	800	100

Note:

1. Doses are given in terms of metal. The experiments were carried out on mice.
2. MTD - maximum tolerated dose for survival.
3. LD50 - dose that causes the death of 50% of animals.
- LD100 - dose that causes the death of 100% of animals.

Along with the depletion of resources of traditional, relatively safe oil for environment, production of heavy oil and oil sands will increase, often enriched with biotoxic elements and sulfur. Therefore, it is necessary to timely standardize methods and expand the range of both chemical-analytical and medical biological studies of hydrocarbons of raw materials and processed products, so as not to aggravate unfavorable ecological situation, especially in the central, most populated regions of Russia with high

energy consumption and many facilities using fuel oil enriched with both PTE and S compounds.

Among the biologically active toxic elements, the highest concentrations in hydrocarbons reach such as: vanadium, nickel, cobalt, mercury, sulfur, less often uranium and arsenic. But if the presence of hydrogen sulfide is detected in raw materials by smell almost immediately, then most other active toxicants go unnoticed. So, mercury vapor, arsenic, radioelements

can be detected in a timely manner only with a special study, which emphasizes the need for not only an ordinary study of the qualitative composition of oil (gases), but also the most common toxic components in them. Hence the need in identifying the geological and geochemical patterns of accumulation and distribution toxic elements in natural hydrocarbons in order to timely emphasize attention, already at the stage of search and exploration, to the need for detailed analysis of the composition of hydrocarbons in certain regions for certain components.

As noted above, we do not consider the toxic components of hydrocarbons- compounds of the oil itself: benzenes, 3, 4-benz-(a)-pyrenes, etc. They, like other components crude oil, refer to the phenomena of mainly surface, obvious environmental environmental damage, i.e. to the form of defeat that is associated with any surface oil spills. They are relatively well studied and it is for them a variety of protective, control and rehabilitation measures are being developed. Not We also paid special attention to the study of sulfur content in oil and gases, since according to There is an extensive research and reference literature on these issues.

#### **Prevalence of PTE in Rocks and Hydrosphere**

Since the entire ontogenesis, both OM and HC, takes place in the sedimentary environment, it is necessary characterize, at least in the shortest possible way, the main sources of PTE inflow into rocks and waters of the sedimentary cover and their distribution.

We have already noted that in various geological, geochemical and geostructural conditions there are different associations of potentially toxic elements-impurities in hydrocarbons.

## **DISCUSSION AND CONCLUSION**

In the course of atmospheric precipitation, the air environment is purified and metals biotoxicants settle, are deposited by soils, surface and ground waters, accumulated by local biota. Zones of entry of such biotoxicants into the environment located directly near fuel and energy facilities processing and consuming hydrocarbons raw materials, mainly fuel oils enriched with metals. Propagation range and levels atmospheric pollution depend on the power of the source, emission conditions, time impact, meteorological, climatic, relief and other conditions. As you remove from the source of emission, there is a decrease in the concentrations of metals in the form of aerosols in air, usually exponentially.

The level of knowledge of impurity components in oil is also insufficient, within even explored deposits. As can be seen from the list, the richness of oil in microimpurities of various elements - is indisputable, but the analyzes themselves with the

completeness of the studies, similar to those given above, to unfortunately too few.

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#### **Conflicts of interest**

There is no conflict of interest

## **REFERENCES**

1. Bauer, P., Dueben, P. D., Hoefler, T., Quintino, T., Schulthess, T. C., & Wedi, N. P. (2021). The digital revolution of Earth-system science. *Nature Computational Science*, 1(2), 104-113.
2. Beloglazov, I. I., Petrov, P. A., & Bazhin, V. Y. (2020). The concept of digital twins for tech operator training simulator design for mining and processing industry. *Eurasian Mining*, 2020(2), 50-54.
3. Boschert, S., & Rosen, R. (2016). „Digital Twin-The Simulation Aspect “in Mechatronic Futures: Challenges and Solutions for Mechatronic Systems and their Designers, P. Hehenberger und D. Bradly, Hg.
4. Hang, B. T. T., Huy, D. T. N., An, P. T., Ngoc, N. T. B., & Duyen, H. T. M. (2020). Current situation of Bitcoin management and use: perspectives from the world and recommendations for vietnam. *Management*, 24(2).
5. Haag, S., & Anderl, R. (2018). Digital twin-Proof of concept. *Manufacturing letters*, 15, 64-66.
6. Huy, D. T. N. (2015). The critical analysis of limited south asian corporate governance standards after financial crisis. *International Journal for Quality Research*, 9(4), 741.
7. Huy, D. T. (2012). Estimating Beta of Viet Nam listed construction companies groups during the crisis. *Journal of Integration and Development*, 15(1), 57-71.
8. Huy, D. T. N., & Hien, D. T. N. (2010). The backbone of European corporate governance standards after financial crisis, corporate scandals and manipulation. *Economic and business review*, 12(4), 1.
9. Huy, D. T. N., Le, T. H., Hang, N. T., Gwoździewicz, S., Trung, N. D., & Van Tuan, P. (2021). Further researches and discussion on machine learning meanings-and methods of classifying and recognizing users gender on internet. *Advances in Mechanics*, 9(3), 1190-1204.
10. Tinh, D. T., Thuy, N. T., & Ngoc Huy, D. T. (2021). Doing Business Research and Teaching Methodology for Undergraduate, Postgraduate and Doctoral Students-Case in Various Markets Including Vietnam. *Ilkogretim Online*, 20(1).
11. Thi Ngu, D., Huong, D. T., Huy, D. T. N., Thanh, P. T., & Dongul, E. S. (2021). Language teaching application to English students at master's grade levels on history and macroeconomic-banking management courses in universities and colleges. *Journal of Language and Linguistic Studies*, 17(3), 1457-1468.

12. Huy, D. T. N., Hang, N. T., Trang, P. T. H., & Ngu, D. T. (2021). Discussion on Case Teaching Method in a Risk Management Case Study with Econometric Model at Vietnam Listed Banks—Issues of Economic Education for Students. *Review of International Geographical Education Online*, 11(5), 2957-2966.
13. Thuy, D. V. T., Huy, D. T. N., Anh, V. T. K., Thach, N. N., & Hanh, H. T. (2021). Quality of education of ethnic minority communities in vietnam-problems and recommendations. *Ilkogretim Online*, 20(4).
14. Huy, D. T. N., & Hien, D. T. N. (2010). The backbone of European corporate governance standards after financial crisis, corporate scandals and manipulation. *Economic and business review*, 12(4), 1.
15. Dmitrieva, D., & Romasheva, N. (2020). Sustainable development of oil and gas potential of the Arctic and its shelf zone: The role of innovations. *Journal of Marine Science and Engineering*, 8(12), 1003.
16. Official website of the Ministry of Energy of the Russian Federation. Oil production raw materials. In the link: URL <https://minenergo.gov.ru/node/1209>
17. Shen, G., Manafian, J., Huy, D. T. N., Nisar, K. S., Abotaleb, M., & Trung, N. D. (2022). Abundant soliton wave solutions and the linear superposition principle for generalized (3+ 1)-D nonlinear wave equation in liquid with gas bubbles by bilinear analysis. *Results in Physics*, 32, 105066.
18. Hodgkinson, J. H., & Elmoultie, M. (2020). Cousins, siblings and twins: A review of the geological model's place in the digital mine. *Resources*, 9(3), 24.
19. Huy, D. T.N., Loan, B. T., & Anh, P. T. (2020). Impact of selected factors on stock price: a case study of Vietcombank in Vietnam. *Entrepreneurship and Sustainability Issues*, 7(4), 2715-2730.
20. Huy, D. T.N., Dat, P. M., & và Anh, P. T. (2020). 'Building and econometric model of selected factors' impact on stock price: a case study'. *Journal of Security and Sustainability Issues*, 9(M), 77-93.
21. Huy, D. T. N., Nhan, V. K., Bich, N. T. N., Hong, N. T. P., Chung, N. T., & Huy, P. Q. (2021). Impacts of internal and external macroeconomic factors on firm stock price in an expansion econometric model—a case in Vietnam real estate industry. In *Data Science for Financial Econometrics* (pp. 189-205). Springer, Cham.
22. Van Pham, H., Nguyen, H. X., & Huy, D. T. N. (2020). Impact of corporate entrepreneurship and organizational culture on business performance: The role of supply chain management. *Int. J Sup. Chain. Mgt Vol*, 9(3), 1072.
23. Nguyen, H. X., Huy, D. T. N., & Van Pham, H. (2020). Supply Chain Agility and Internal and External Process Connectivity: The Impact of Supply and Product Complexity. *Int. J Sup. Chain. Mgt Vol*, 9(2), 518.
24. Patra, I., Huy, D. T. N., Alsaikhan, F., Opulencia, M. J. C., Van Tuan, P., Nurmatova, K. C., ... & Karbalaeei, S. (2022). Toxic effects on enzymatic activity, gene expression and histopathological biomarkers in organisms exposed to microplastics and nanoplastics: a review. *Environmental Sciences Europe*, 34(1), 1-17.
25. Ivanov V.V. (1994). *Ecological geochemistry of elements* (Vol.6). M. "Nedra".
26. Refonaa, J., Huy, D. T. N., Trung, N. D., Van Thuc, H., Raj, R., Haq, M. A., & Kumar, A. (2022). Probabilistic methods and neural networks in structural engineering. *The International Journal of Advanced Manufacturing Technology*, 1-9.
27. Kalidindi, S. R., Buzzy, M., Boyce, B. L., & Dingreville, R. (2022). Digital Twins for Materials. *Front. Mater.*
28. Lari, K. S., Davis, G. B., & Rayner, J. L. (2022). Towards a digital twin for characterising natural source zone depletion: A feasibility study based on the Bemidji site. *Water Research*, 208, 117853.
29. Litvinenko, V. S. (2020). Digital economy as a factor in the technological development of the mineral sector. *Natural Resources Research*, 29(3), 1521-1541.
30. M Fannakhosrow, S Nourabadi, DT Ngoc Huy, N Dinh Trung. (2022). A Comparative Study of Information and Communication Technology (ICT)-Based and Conventional Methods of Instruction on Learners' Academic Enthusiasm for L2 Learning, *Education Research International 2022*
31. Mei, H., Haider, M. F., Joseph, R., Migot, A., & Giurgiutiu, V. (2019). Recent advances in piezoelectric wafer active sensors for structural health monitoring applications. *Sensors*, 19(2), 383.
32. Krasnogorskoy N.V. (Ed.). (1992). *Living systems under external impact* (Vol. 2). St. Petersburg, Gidrometeoizdat.
33. Dao, M. N., & Bui, T. H. V. (2022). Measurement of Vietnam Cultural Resources Attractiveness: The Case of Vietnam. *International Journal of Ecosystems and Ecology Science (IJEES)*, 13(1).
34. Trung, N. D., Huy, D. T. N., Jade Catalan Opulencia, M., Lafta, H. A., Abed, A. M., Bokov, D. O., ... & Kianfar, E. (2022). Conductive Gels: Properties and Applications of Nanoelectronics. *Nanoscale Research Letters*, 17(1), 1-21.
35. Dat, N. D., Lan, N. T. N., Huy, D. T. N., Yen, L. L., Dung, N. T., & Dat, P. M. (2020). Plans for better business performance of Sony in Japan-and suggestions for management and financial accounting transparency. *Management*, 24(2).
36. ND Trung, DTN Huy, TH Le. (2021). IoTs, Machine Learning (ML), AI and Digital Transformation Affects Various Industries-Principles and Cybersecurity Risks Solutions, *Webology*, 18

37. Trung, N. D., Huy, D. T. N., & Le, T. H. (2021). IoTs, Machine Learning (ML), AI and Digital Transformation Affects Various Industries-Principles and Cybersecurity Risks Solutions. *Management*.
38. Thach, N. N., Hanh, H. T., Huy, D. T. N., & Vu, Q. N. (2021). technology quality management of the industry 4.0 and cybersecurity risk management on current banking activities in emerging markets-the case in Vietnam. *International Journal for Quality Research*, 15(3), 845.
39. N Thi Hang, D Thi Tinh, DT Ngoc Huy, PT Hong Nhung. (2021). Educating and training labor force Under Covid 19; impacts to meet market demand in Vietnam during globalization and integration era. *Journal for educators, teachers and trainers*, 12(1)
40. Hang, N. T., Huy, D. T. N., Le, T. H., Gwoździewicz, S., Thanh, N. T. P., Dung, N. T., & Hien, D. T. N. (2022). Further Analysis on Internet of Things (IOT) Applications in Emerging Markets and Vietnam. In *Ambient Communications and Computer Systems* (pp. 407-416). Springer, Singapore.
41. Trung, N. D., Hai, N. T., Huy, D. T. N., Van Tuan, P., Hoa, N. T., & Dung, N. T. (2021). Recommendations for TQM in Manufacturing Companies with Pyrolysis Technology in Emerging markets and Meanings of Capital Financing–Case in Viet Nam. *Advances in Mechanics*, 9(3), 1376-1389.
42. Hang, N. T., Huy, D. T. N., Hien, D. T., & Nam, V. Q. (2021). IOT Impacts and Digital Transformation at Listed Vietnam Banks. *Management*.
43. Trung, N. D., Huy, D. T. N., Van Thanh, T., Thanh, N. T. P., Dung, N. T., & Thanh Huong, L. T. (2021). Digital transformation, AI applications and IoTs in Blockchain managing commerce secrets: and cybersecurity risk solutions in the era of industry 4.0 and further. *Management*, 18, 10-14704.
44. Hoang, N. T., & Huy, D. T. N. (2021). Determining factors for educating students for choosing to work for foreign units: Absence of self-efficacy. *JETT*, 12(2), 11-19.
45. Anh, P. T., Huy, D. T. N., & Loan, B. T. T. (2020). Analysis of a Financial Model for Converting Industrial Waste Tires into Clean Energy for Environment Protection-A Model in Developing Countries. *Wseas Transactions on Environment and Development*, 15, 447-454.
46. Van Tuan, P., Huy, D. T. N., Hoa, M. N. T., & Huong, D. T. (2021). Technology Applications, IT Effects on Marketing and Role of Digital Marketing In Stock Investment Industry-And Industrial Competitors Impacts On Business Risk Level. *Design engineering*, 1828-1843.
47. Nam, V. Q., Huy, D. T. N., Hang, N. T., Le, T. H., & Thanh, N. T. P. (2021). Internet of Things (IoT) Effects and Building Effective Management Information System (MIS) in Vietnam Enterprises and Human-Computer Interaction Issues in Industry 4.0. *Management*.
48. Dat, P. M., Mau, N. D., Loan, B. T. T., & Huy, D. T. N. (2020). COMPARATIVE CHINA CORPORATE GOVERNANCE STANDARDS AFTER FINANCIAL CRISIS, CORPORATE SCANDALS AND MANIPULATION. *Journal of security & sustainability issues*, 9(3).
49. Ha, T. T. H., Khoa, N. B., Huy, D. T. N., Nhan, V. K., Nhung, D. H., Anh, P. T., & Duy, P. K. (2019). Modern corporate governance standards and role of auditing-cases in some Western European countries after financial crisis, corporate scandals and manipulation. *International Journal of Entrepreneurship*, 23(1S).
50. Tynkkynen, V. P. (2019). The climate is changing Russia: from a hydrocarbon to an ecological culture. In *The Energy of Russia* (pp. 114-130). Edward Elgar Publishing.
51. Wang, Z., Akhavan, M., Kashkouli, M. N. I., Opulencia, M. J. C., Huy, D. T. N., Van Tuan, P., & Davarpanah, A. (2022). Sustainable wastewater management from shale oil production wells: emerging opportunities and barriers. *Applied Water Science*, 12(7), 1-6.