Electroless nickel-phosphorus (–Ni-P–) coatings are widely used in many industrial applications due to their excellent ~~wear~~ abrasion resistance, corrosion resistance–, hardness–, toughness–, and lubricity properties–. By combining nano-sized particles in the Ni-P matrix as a reinforcing phase–, functional nano-composite coatings are produced by electroless ~~co-deposition~~eutectoid process–. The composite properties of Ni-P coatings are greatly improved and some new functions are added–. ~~N~~The nanoparticles ~~such as~~ SiC–, WC–, Al2O3–, TiO2–, and ZnO increase the hardness of the coating–, while nanoparticles such as PTFE (–TM Teflon–)–, MOS2–, and graphite increase the lubricity–. Among these nanoparticles–, PTFE has low surface energy and friction coefficient (–good as non-adhesive surface and dry lubrication–)–, and has attracted increasing interest due to its ~~dirt resistance~~antifouling properties–, ~~wear~~abrasion resistance–, and corrosion resistance–. Ni-P-PTFE can be used as an anti-adhesive coating–. Fluorine atoms bonded to the outer layers of these molecules have major physical properties such as low surface energy and very low friction coefficient of PTFE polymers–. Both Ni-P and PTFE properties can be used simultaneously by ~~co-precipitating~~eutecticizing PTFE in the coating matrix–. PTFE polymers have excellent antifouling properties due to their low surface energy (–18.6 mN/m–)–. The use of Ni-P-PTFE composites for contamination reduction is ~~expected~~anticipated as a solution to the serious problem of the formation of deposits such as lime on the heat exchanger surface–. This sediment is one of the essential problems in the design and operation of many production facilities and much processing equipment–. This undesirable sediment may have two kinds of effects on the equipment–.

- The thermal conductivity of the deposited material is low and the heat transfer resistance is high–, which reduces the efficiency of the heat exchanger .
- When deposited on piping–, the cross-sectional area of the fluid passage decreases and friction increases–, causing pressure ~~drop~~loss throughout the system–.

Such accumulation of sediment can be reduced and costs can be reduced–. ~~The s~~Surfaces with low surface energy ~~was~~have been found to have less deposition–, and many polymer coatings have been used–. Conventional polymer coating agents have limited industrial applications because of their low thermal conductivity–, ~~wear~~abrasion resistance–, and poor adhesion to the substrate–. Since Ni-P-PTFE coatings are based on metal composites–, their thermal conductivity–, mechanical strength–, and ~~wear~~abrasion resistance are much better than those of conventional PTFE coatings–, and their surface energy is also low–.

Commented [QCA1]: Attention to detail - Correct Punctuation and Style

Commented [QCA2]: Mistranslation - Accuracy of information and content at word, phrase, sentence, and paragraph level for translation

Commented [QCA3]: Mistranslation - Accuracy of information and content at word, phrase, sentence, and paragraph level for translation

Commented [QCA4]: Subject Matter Expertise - Scientific Nomenclature Accuracy

Commented [QCA5]: Subject Matter Expertise - Scientific Nomenclature Accuracy

Commented [QCA6]: Subject Matter Expertise - Technical Word Accuracy

Commented [QCA7]: Subject Matter Expertise - Technical Word Accuracy

Commented [QCA8]: Language - Accurate Word/Phrase Choice

Commented [QCA9]: Language- Correct Grammar Expressions (adjectives/adverbs, tense, voice, relative clause)

Commented [QCA10]: Subject Matter Expertise - Technical Word Accuracy

Commented [QCA11]: Language - Sufficient Clarity and Readability

Commented [QCA12]: Language- Correct Grammar Expressions (adjectives/adverbs, tense, voice, relative clause)

SAMPLE