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PD Pulse Sequence Studies with model transformer insulation in Mercaptans contaminated transformer oil

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Corrosion of copper conductors in transformers due to presence of mercaptan sulfur in oil is a problem affecting the paper-oil insulations, potentially leading to failure of transformers. The mercaptan sulfur reacts with the copper conductor and forms copper sulfide on the surface. Copper sulfide also migrates from conductor surface to outer layers of paper and from there it is carried to other parts of transformer. These may become the sites for the initiation of additional partial discharges along with the existing PD which causes damage to the layers of paper in contact with conductor. Over the last three decades computer based Partial Discharge data acquisition and analysis are common in use. The pulse magnitude and its phase position are the most commonly measured parameters. This paper presents pulse sequence studies with PD data obtained for Paper covered copper conductor (PCCC) in Mercaptans sulfur contamination in transformer oil. The paper also discusses the changes in the inter pulse time and their relation with the phase of occurrence of PD when contamination in oil occurs.

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